

#1 Atari Computer Magazine

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# Antic

The **ATARI**® Resource

JULY 1985

VOLUME 4, NUMBER 3

## COMPUTER CHALLENGES

Atari Chess

SSI Wargame Commander

Four Type-In Games

DOS 2.5 to the Rescue!

Mapping Atari 130XE

E: 8 Type-In Programs

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THEODORE A GRESH  
2295 NORTHFIELD  
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74470 12728

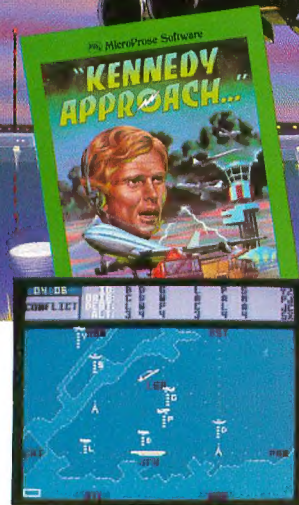
A OKAMOTO



# "KENNEDY APPROACH..."

NEW  
SPEAKING SIMULATION  
See and Hear All the Action!

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Commodore-64 Screen Picture

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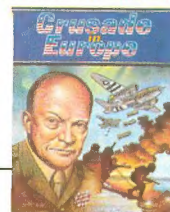
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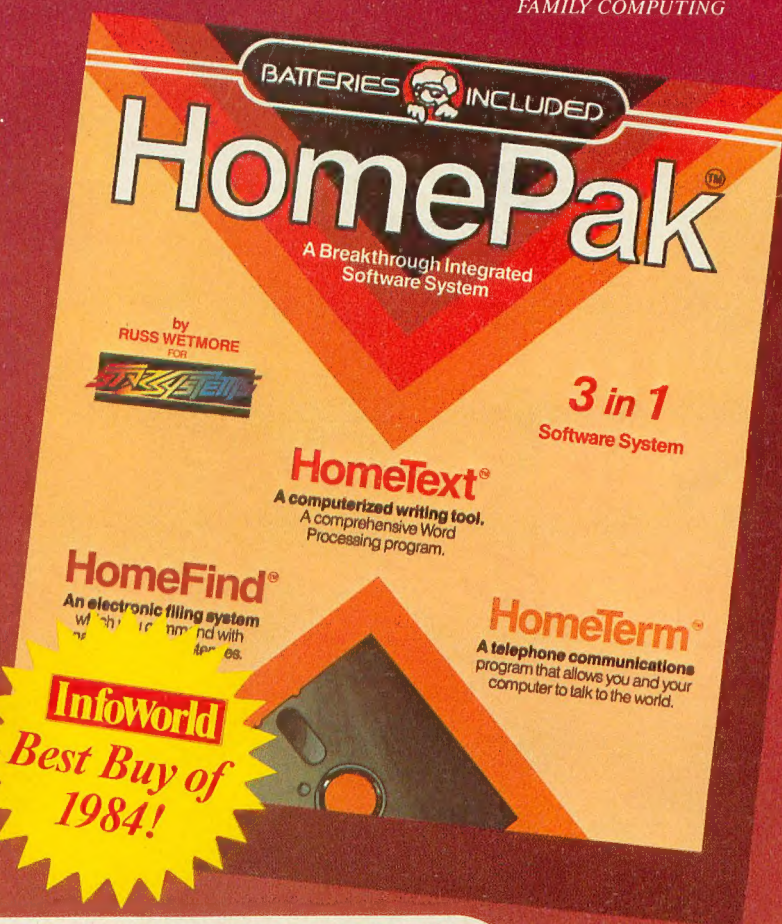
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<sup>1</sup> On 48K diskette for the Apple II with Applesoft ROM, Apple II+, IIe, and IIc.  
<sup>2</sup> On 48K diskette for Atari Home Computers.  
<sup>3</sup> On 64K diskette for the Commodore 64.

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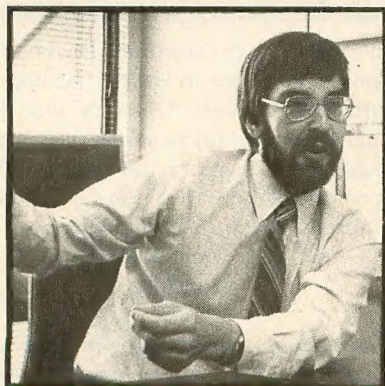
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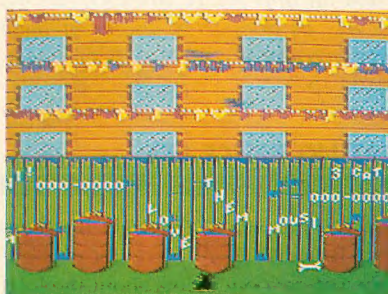
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# i/o board

*We wish we could personally answer every letter from our readers, but ANTIC Magazine and CompuServe ANTIC ONLINE receive far too much mail to make this possible. Our priority must be to answer in print (and online) questions that are of greatest interest to a significant number of readers!*

## 600XL EXTINCTION?

As a concerned owner of the 600XL, I'd like to know what happened to it. Will there be a 64K expansion module from Atari? I hope Atari doesn't forget the thousands of 600XL owners.

Steve Bowen

Penobscot, MA

*Although Atari is not planning to produce more 600XLs, it is not a totally extinct machine. With the 64K expansion module, available from Microbits Peripheral Products, it is a viable computer. In fact, we use one daily at Antic.*

—ANTIC ED

## SYNCalc MARCHES ON

I want to congratulate you on the February article about taxes and SynCalc. The template was so useful that I adapted it for state and local taxes as well.

N. Clark

Lansing, MI

*Thank you for the kudos. Antic is currently looking for more SynCalc templates. We'd like to see templates for Adjustable Rate Mortgages and for Long Distance Phone Service Cost comparisons. If you have such, please send it on a disk along with a short note about your finance credentials.* —ANTIC ED

## SOFTWARE REBATE

Datasoft recently informed us of a special rebate they're offering through August 31, 1985. Specially marked software packages will include \$5 rebate coupons. The software in the offer includes **Bruce Lee**, **Conan**, **Dallas Quest**, **PacMan**, **Dig Dug**, **Pole Position**, **Mr. Do**, **Zaxxon**, **Letter Wizard**.

## ATARI AMNESIA

While playing SSI's **Computer Baseball** on my 800XL, I got an Error 2 (memory insufficient) on line 705 every time I brought in a relief pitcher. I ran the Atari self-diagnostic memory test and found that only 40 of the 48 little boxes appeared and turned green. Can you help?

Dennis Possi

Singapore

*We don't know why this program is filling your memory, but you might try the memory diagnostic with the disk drive turned off and BASIC disabled. BASIC uses 8K, as does DOS. Either of these could account for your missing boxes.*

—ANTIC ED

## BEATING BRUCE LEE

Have you people out there got the blues about Bruce Lee? All I ever hear about Bruce Lee are complaints about the long introduction. Didn't anyone ever hear about the [SPACE] key? It's the long, skinny key at the bottom of the keyboard. Press it, and BINGO! the introduction ends.

Also, if you find that you don't have enough "free guys", then when you get to the room where you get the first free, keep running in and out of the room and frees will appear the first five times you do this.

Evan Gold

Brooklyn, NY

*We assure you that Antic pressed the [SPACE] bar and everything else on the Atari keyboard not once but many times in our vain attempt to escape from Bruce Lee's smiling face. Apparently you are lucky enough to own a later version of the game which allows you to avoid the introduction. Wanna trade?* —ANTIC ED

continued on page 8



## LOTSABYTES CONTINUES THE WAR!

**WAR** on high prices! We're going to put an end to the software price 'ripoff'. And **YOU** can help! Just keep those orders coming while you continue to enjoy the **quality, quantity, selection** and **low prices** that you deserve. Our National Public Domain Copy Service will save you time, tedious work, and money. And our **exclusive** distribution of **sharply discounted** commercial programs will bring you some of the finest programs for the lowest possible price, usually 50% and more off retail! You continue to get **FREE BONUSES** with each purchase of three or more disks.

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### GREAT GAMES!

**SPACE GAMES:** Three games for one low price! In **Aliens** you can't get them all and the pace keeps getting faster. When you do get rid of most of them, you are left in a space quadrant peppered with mines. Will you **Survive**? If you do, you must penetrate the alien's spaceship, survive a **Robot Attack**, and get back your stolen 'cloaking' device! Interested?

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**THE BEAN MACHINE** by Steve Robinson is an Award Winning Arcade game that will drive you crazy balancing a series of beams while trying to get all the beans to roll down, without touching, all the while avoiding 'strange creatures' who drop in to steal the beans. It's addicting!

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**DIGGERBONK**, another Award Winning game by Steve Robinson, challenges you to find your way through a continuously scrolling maze while avoiding some really strange creatures. Along the way you will need to Bonk some of them, but watch out for the bombs.

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# JUNE ANTIC ONLINE

## Exclusive CES Coverage

### SPINNAKER RESPONDS

*This letter from the chairman of Spinnaker Software came in response to the May 1985 Antic editorial recommending that readers write to software companies that don't convert bit programs for the Atari.*—ANTIC ED

I would like to clarify a few of the issues surrounding software development for the Atari.

The decision of which machines to support with software is never simple. Before bringing a new title to market, we weigh the growth factors (how well will the machine sell?), the market factors (will those owners be interested in our software?), and the economic factors (how much will it cost us to develop a title for that machine?).

I can assure you that the decision is one of the most difficult we face in developing software, and it is never made lightly.

With this year's introduction of the new Atari machines, the decision takes a new turn. We are talking, right now, with Atari about developing products for the new Atari machines. Such development would make it more economically feasible to support both ends of the Atari line.

I would like Antic readers to know that we at Spinnaker do understand their needs, and that we're working hard to provide them with the best product on the market. We have, in the past, supported all of our customers with a wide variety of exciting new titles every year, and we will continue to do so.

Please encourage your readers to write. We always appreciate our customers' interest.

William Bowman  
Chairman, Spinnaker  
Software

### THE FORTH DIMENSION

The FORTH Interest Group (you guessed it, FIG) recently announced its author recognition program. For more information on this 4,800-member non-profit organization, contact FIG's hotline, (415) 962-8653, or write to them at P.O. Box 1105, San Carlos, CA 94070.

Type GO ANTIC when you log onto CompuServe in June, and you'll be able to read our on-the-spot bulletins direct from the Consumer Electronics Show in Chicago—with all the details about the new Atari products being showcased.

Not only that, you will also find an extensive preview of our groundbreaking August **TeleComputer** issue. You'll see descriptions—or even actual excerpts—from upcoming August articles that are must reading for anybody who uses a modem (or who plans to start using one).

For example, **HomeTerm** programmer Russ Wetmore tells you how to get more power out of the inexpensive **1030 Modem**. There's a type-in terminal program with hot new features. Another type-in program makes it easy to create ani-

mated cartoons on a BBS or on your own home screen.

The latest TeleComputing products for Atari will be reviewed. And when you log onto ANTIC ONLINE, you can always expect to find the latest news and information about the Atari world—including the most recent developments for the 16-bit ST computers.

From most areas, there are no long distance charges when you log onto CompuServe, and there are never any charges for ANTIC ONLINE besides the standard hourly CompuServe connect fee.

ANTIC ONLINE Special Bulletins may be downloaded for reprinting in newsletters of user groups affiliated with the Worldwide Users Network. Officers of unaffiliated groups should write to the WUN coordinator at Antic for details.



## help!

### MANEUVER AND HEARTS

If you're finding blue hearts all over your **Maneuver** title screen (**Antic**, April, 1985) LIST the program to disk or cassette, type NEW, then re-ENTER it and SAVE it.

### SG-10 FONT MAKER

Those with the new Gemini SG-10 printers may have discovered that **Font Maker** (**Antic**, March, 1985) will not work on these printers. Help is here.

First, set DIP switch 1-5 on your SG-10 to OFF and then type in the **Font Maker Modification** listing that you'll find in this month's Listing Section, page 59.

LIST the modification to disk, type NEW, LOAD the original **Font Maker** program, then ENTER the **Modification**.

Finally, SAVE the entire modified program. (Those confused between LIST and SAVE should see "Why You Want DOS 2" in **Antic**, April, 1985.)

### TYPO II UPDATES

Since **Antic** began using the new TYPO II proofreading program in January 1985, we have been getting requests for TYPO II codes to some of the most popular pre-1985 programs.

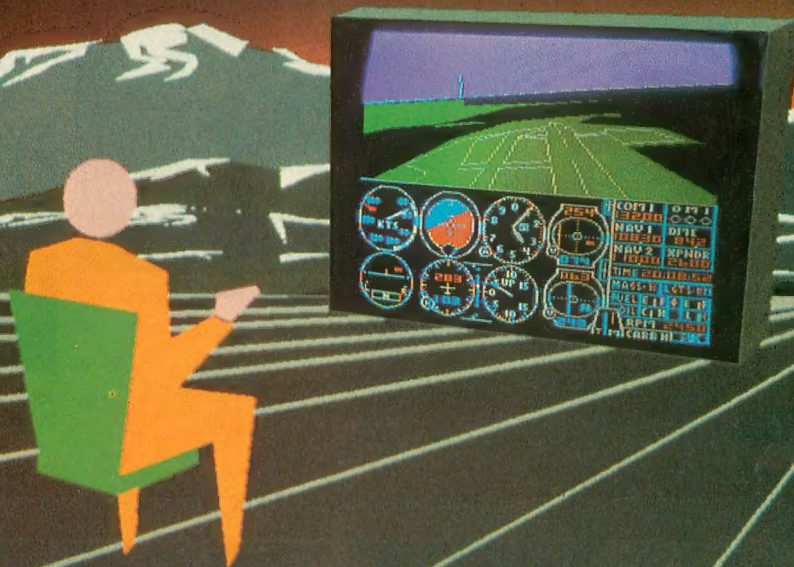
In this month's Listing Section, you'll find the line-by-line codes—just the codes—for "Biffdrop," "Escape from Epsilon," "Advent X-5," and "Adventure Island." We'll print additional TYPO II updates if we get enough requests. Enjoy.





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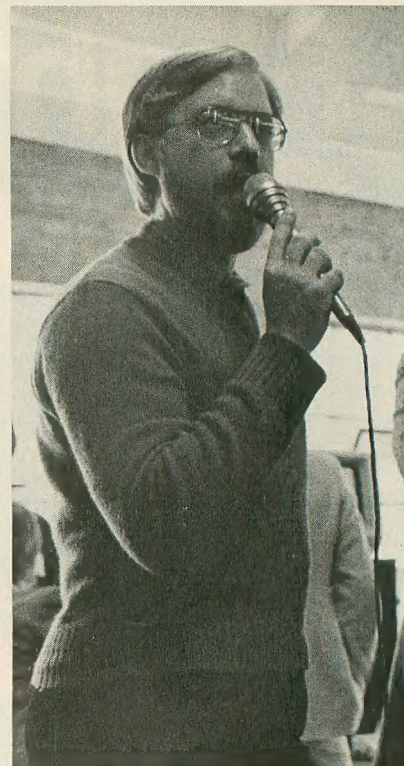
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Antic's 520ST is demonstrated by Richard Frick (front right), Atari ST Software Development Director. That's Antic Contributing Editor Ken Harms at rear left.



John Scrutch, Atari XE Software Development Director at the microphone.



Atari Engineering Vice President Tom Brightman answers questions.

Photography by ERIK WEBER



Professor Joseph Lyons demonstrates the Virtuoso music generator, using Antic's 130XE computer to control four Casio CZ-101 synthesizers.

# ANTIC ANNIVE

*Atari world comes to Antic's party and*





Some of the crowd at the Worldwide Users Network Inaugural Meeting.

Cutting the birthday cake for 250 guests is Antic Art Director Marni Tapscott.



From left: Ron Luks, Antic Online Editor; Sam Tramiel, President of Atari Corp.; Antic Publisher James Capparelli; Sig Hartmann, President of AtariSoft division.

# RSARY ALBUM

*Worldwide User Network start-up meeting*



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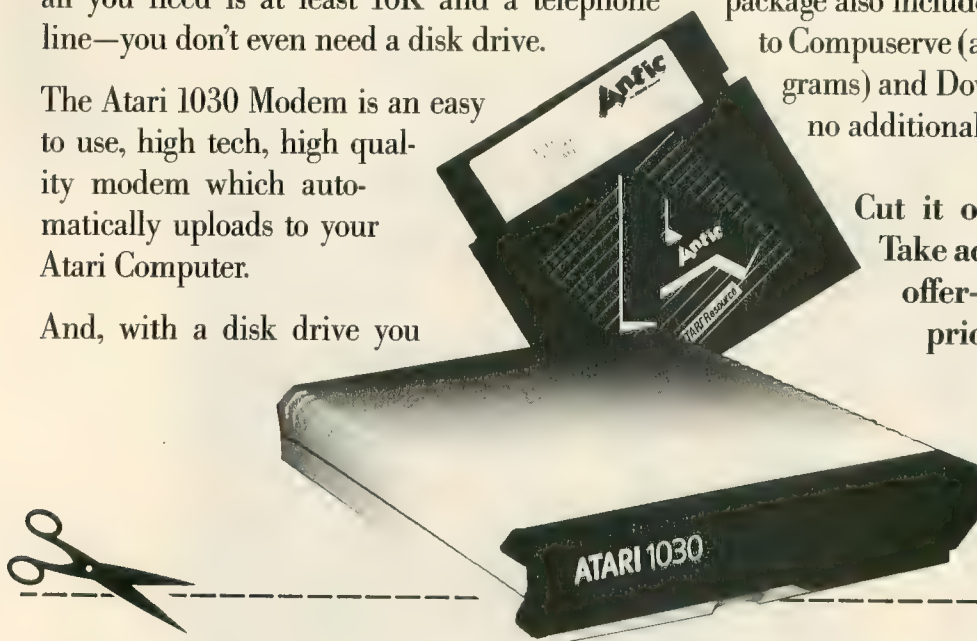
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# DUCKS, SEAHORSES AND MUPPETS

## *New educational software*

Reviewed by Anita Malnig

In **Big Bird's Funhouse** (CBS) the Sesame Street Muppets Bert and Ernie, Cookie Monster, Grover, Oscar, etc. are all hiding in a funhouse. The child must guess who's hiding where. Big Bird lets you know if you've guessed correctly. You must use a soft plastic overlay on the keys to indicate special squares for the child to push. This doesn't fit very well and tends to slide around.

At each of the five levels, the play is essentially the same. You hit some keys. A window in the funhouse will pop up and you see a Muppet character. Then you hit the hide key, the character disappears and you try to remember which characters are still around. Each character has his own musical theme which the child will come to recognize along with the character himself. (All the Muppets here are male.)

At the first two levels the empty open windows will be clues as to how many Muppets are missing. Later on all the windows are open and empty. Later still, you guess the order in which the characters appear. The animation and music when the Muppets are hiding is funny and lively but the graphics seemed a little fuzzy. So many educational programs are achieving superb quality in their graphics that one can't help but be

somewhat disappointed by the slightly off-register resolution here.

But the graphics are less of a disappointment than the fact that this is essentially a skimpy, one-theme program. I think that even pre-school children would get tired of the repetitive gameplay rather quickly.

However, right on the money is **Ducks Ahoy!** published by CBS Software and developed by Joyce Hakansson Associates in Berkeley, California.

You're in Venice and in your gondola you must pick up ducks who want to go to the beach. You maneuver your boat through the canals and pick up ducks at the doorways of the various buildings. Then you take them up to the beach. But, you've got to avoid the hippo who upsets boats and get to the door of each building before the comically waddling ducks plop themselves into the water. The ducks don't quite know how to stop. You've got to have the boat waiting for them.

The graphics are crisp, the waddling ducks are very amusing and the music charmingly duplicates an Italian song, such as a gondolier might play!

The ducks do move in a pattern (after you play a while you begin to pick it up). You must determine how

long it will take you to steer the boat to pick them up in time. You can pick up two in a row and take them both to the beach, but you must be sure you'll avoid the hippo. Ten ducks on the beach wins a game.

This simple, clever game can help young children with their fine motor coordination and counting skills. Older children can work on planning the most efficient routes and predicting the outcome of the game.

I've seen kids thoroughly involved with this game—and believe me, it can capture the parents' attention too! While this is also a one-theme program, it becomes an engaging adventure. Short, clear documentation accompanies the software, as well as a story book with duck jokes and activities such as making duck feet and duck lips! Lots of fun!

Also from Joyce Hakansson Associates for CBS is **Sea Horse Hide 'n' Seek**. Here you must maneuver your seahorse through a coral reef as it encounters old wrecks and seaweed. You also must guide it away from the lagoon fish who let out a special sound so you know they're coming.

This program teaches about some of the real properties of sea horses.

continued on next page



They use camouflage to hide. You steer your sea horse to a large piece of coral and it will assume the color of the coral.

Your goal is to get the sea horse home by crossing the reef. And it's quite an adventure to do so. A child playing this will have fun avoiding the lagoon fish, changing colors and hiding, and in the bargain learn something about underwater life.

Both Ducks Ahoy and Sea Horse Hide 'n' Seek are 16K cartridges, so they can be used on any Atari without a disk drive or cassette.

**Muppet Learning Keys** was produced by Jim Henson Associates and Koala Technologies. This Keyboard is designed for use by young children who have difficulty mastering the standard computer keys.

On the Muppet Keys, letters are set out in a five-row square in their regular A-B-C- sequence. The numbers are arranged to look like a ruler. There are other keys— Stop, Go, Erase and Zap!—which all have funny cartoon markings and perform special functions.

With the use of an adapter disk you can run your other software for your child to play with via the Muppet Keys. But the special games for the keyboard now available on Apple and Commodore are not out for the Atari.

And when I tried to run other popular software on an 800XL with the Muppet Keyboard in place, the programs all crashed. I've spoken with people at Koala who assure me this is not supposed to happen. Be sure and try your child's favorite

games with this keyboard at the store before you make a purchase.

## BIG BIRD'S FUNHOUSE

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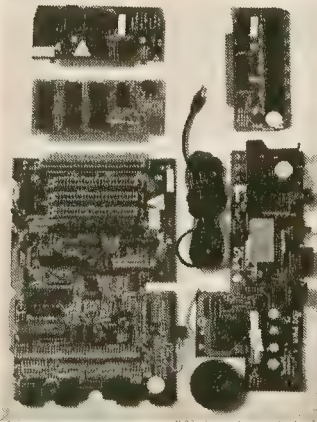
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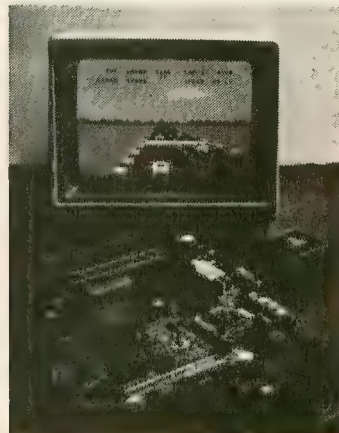
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# eight new synapse games

## synapse merges with Broderbund

by JACK POWELL,  
Antic Technical Editor

**E**ight Synapse action games for Atari have just been released—six of them in 2-for-1 packages priced at \$24.95 — marking the completed merger of Synapse Software and Broderbund Software.

Contracts for the purchase of Synapse by Broderbund were actually signed in October, 1984. But details of the agreement between two of the top independent producers of Atari software only now have become available.

Some months before the purchase, Synapse came into financial difficulties. They had an exclusive distribution agreement with Atari for the business application series **SynFile+**, **SynCalc** and **SynTrend**. After Jack Tramiel bought Atari, he took the position that the contract was not binding on the new owners. Synapse stopped getting payments and filed a lawsuit.

The owners of Synapse and Broderbund had been close friends since the early days of home computers. A merger between the two Northern California companies seemed natural. The possibility had been discussed even before the SynApplications disaster.

Some changes at Synapse were immediate. Jon Loveless, formerly vice president of marketing, became acting president, and Brian Lee was named director of product development. Synapse president Ihor Wolosenko became—and remains—creative consultant for the two companies.

### PHASED MERGER

For six months, Synapse continued to operate as a separate entity while agreements were worked out on how to shape the merging companies.

Starting in January 1985, Broderbund took over all Synapse operations except for research and development of new products, which remains at the original Synapse facility in Richmond, California..

Jon Loveless turned down a position as director of sales at Broderbund and became president of a venture capital firm. Brian Lee—a familiar face at Atari users group meetings in the San Francisco Bay Area—became director of the Synapse Division of Broderbund.

Broderbund says it is determined to retain the distinctive personality of the Synapse product line. It knows that Synapse is strong where Broderbund is weak and vice-versa. All Synapse products will retain the Synapse name and continue to be developed by Synapse programmers.

Customer service will continue with no interruption, according to both Synapse and Broderbund. The phone number on current Synapse packages remains valid. In fact, the only immediate noticeable change will be the addition of the Synapse line to the Broderbund catalog.

### STRONGER NOW

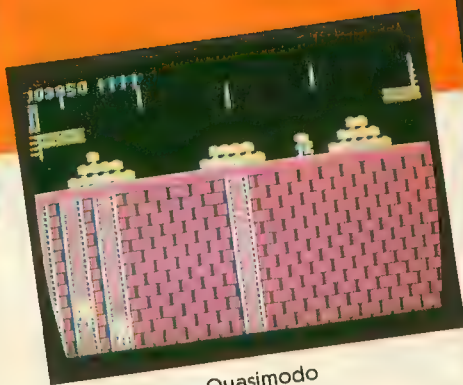
What does all this mean for the future? Well, **Antic** is optimistic about the possibilities.

Broderbund has always developed





Electrician



Quasimodo



Alleycat

Apple products first, porting its programs over to the Atari later. Synapse is one of the best of the independent Atari software producers. Each company produces polished, highly distinctive software and it should be fascinating to watch how they influence one another.

For example, Synapse has spent many months developing a sophisticated parser for adventure games, which will be seen in the upcoming "Electronic Novels" series. (See "Coming Adventures," *Antic*, November 1984.) Now Broderbund will also be using this tool to produce all-text adventure games.

A more immediate boon is the eight new Synapse games for Atari which have just been released.

Six of the eight games are being released as "Double Plays" — which means you get two games for only \$24.95. And these are not inferior games!

Only one of the Double Play games, **Rainbow Walker** is not brand new. (It was reviewed in the September 1984 *Antic*.) Two new games are being released as singles—**Blue Max 2001** (a lot of gamers have been waiting for this one!) is \$29.95 and **Alley Cat** is \$19.95.

## THE GAMES

**Rainbow Walker** is bundled with **Countdown**. Rainbow follows the colorful plight of Cedric as he jumps and leaves a rainbow puddle. Try to create a rainbow of colors as noxious critters undo your work.

**Countdown** lets you penetrate

enemy missile silos and prevent the launch of a warhead aimed at your country's capital.

The noble successor to **Blue Max** is **Blue Max 2001**, which takes you into the future in a typical strafe-and-bomb aerial arcade game. Look for good graphics and a good challenge.

**New York City** is bundled with **Electrician**. Stuck in the Big Apple, you must successfully drive and walk between Central Park, City Hall, the Main Post Office and so on. Simply moving around is a challenge, and each station also contains an additional arcade puzzle.

Success in **Electrician** comes when you connect the wiring to each room in a building. This gives you a key to another building, located one maze away. You'll have to contend with spiders, bats, rats, alligators and other stock nasties.

The third double pack is **Quasimodo** and **Air Support**. **Quasimodo** puts you in the enviable role of the notorious hunchback as he defends his belfry from archers and bats.

**Air Support** gives you control of a helicopter in either an arcade or strategy game. You can set levels of troop strength, difficulty and so on.

Finally, there's Freddy the **Alley Cat**. In case you haven't lived in an alley before, there are dead fish to be collected in garbage cans, open windows to jump through, mad dogs and bad people to avoid. All this so Freddy can get to his sweetheart, Felicia.





# 130XE: HOW ATARI'S NEW 8-BIT DOES IT

*XL compatibility plus 128K power*

by JACK POWELL, Antic Technical Editor

*Just before publication deadline, Atari released first specifications for their new 130XE computer. We wasted no time in passing along the most important points to technical-minded readers.—ANTIC ED.*

**T**he 130XE provides its owner with 128K of system RAM. Since it is an 8-bit machine and therefore incapable of addressing more than 64K of memory, the extra 64K is accessed through selective bank switching.

Atari states that any software developed for the 130XE which does not use the extra RAM will be 100% compatible with their new 64K 8-bit 65XE computer. And of course the 65XE is being billed as 100% compatible with the 800XL model it replaces.

The announced differences between the 130XE and the 65XE are:

1. RAM capacity and organization.
2. Altered usage of the 6520 PIA (Parallel Interface Adaptor).
3. Increased power supply requirements. (1.2 amps at 5 VDC for the 130XE).
4. Enhanced Cartridge Interface.

Figure 1

## 1. Compatibility mode:

VBE	CBE	BA1	BA0	CPU Access	Video Access
1	1	X	X	Main \$4000-\$7FFF	Main \$4000-\$7FFF

## 2. CPU Extended RAM mode:

VBE	CBE	BA1	BA0	CPU Access	Video Access
1	0	0	0	Exp \$0000-\$3FFF	Main \$4000-\$7FFF
1	0	0	1	Exp \$4000-\$7FFF	Main \$4000-\$7FFF
1	0	1	0	Exp \$8000-\$BFFF	Main \$4000-\$7FFF
1	0	1	1	Exp \$C000-\$FFFF	Main \$4000-\$7FFF

## 3. Video Extended RAM mode:

VBE	CBE	BA1	BA0	CPU Access	Video Access
0	1	0	0	Main \$4000-\$3FFF	Exp \$0000-\$3FFF
0	1	0	1	Main \$4000-\$7FFF	Exp \$4000-\$7FFF
0	1	1	0	Main \$4000-\$7FFF	Exp \$8000-\$BFFF
0	1	1	1	Main \$4000-\$7FFF	Exp \$C000-\$FFFF

## 4. Extended RAM mode:

VBE	CBE	BA1	BA0	CPU Access	Video Access
0	0	0	0	Exp \$0000-\$3FFF	Exp \$0000-\$3FFF
0	0	0	1	Exp \$4000-\$7FFF	Exp \$4000-\$7FFF
0	0	1	0	Exp \$8000-\$BFFF	Exp \$8000-\$BFFF
0	0	1	1	Exp \$C000-\$FFFF	Exp \$C000-\$7FFF



The "Enhanced Cartridge Interface" (ECI) is the new parallel bus which will only be available on the 130XE. It's designed as an extension to the cartridge slot and Atari claims it "provides equivalent architectural functionality" to the PBI on the XL line. Whether it provides *physical* equivalence and, if not, whether hardware manufacturers will want to make double plugs for compatible hardware remains to be seen.

See Figure 2 for a chart of ECI signals. No pin numbers were available at press time.

## TWO BANKS

The two 64K banks of memory in the 130XE are called the "main bank" and the "secondary bank." They are identical in layout and control capacity and may be accessed by either the 6502 or ANTIC microchips in various combinations, through manipulation of four previously unused flag bits in the 6520 PIA registers (beginning at \$D300).

The first flag bit is the Video (ANTIC) Bank Enable which, when set to zero, enables video data fetches from the extended RAM. The second bit is the CPU Bank Enable. This allows CPU access of the secondary bank.

The secondary bank is approached through a 16K "access window" at locations \$4000-\$7FFF. At any one time, only one 16K "page" is accessible through this window. The final two new PIA bits are used to specify the chosen page address for the extra 64K bank.

These four bits, along with the ability of both the CPU as well as ANTIC to access the new RAM, provide some interesting combinations. There are four distinct modes of operation:

1. Compatibility mode.
2. CPU extended RAM.
3. Video extended RAM.
4. Extended RAM mode.

In CPU extended mode, only the CPU has access to the secondary bank, ANTIC sees the main bank. Keep in mind that any access to the extended RAM is only through the access window at \$4000-\$7FFF. In this mode, you could place your display lists and screen information in main memory and use extended RAM for program and data storage. No synchronization of bank addressing with display activity is required on the part of the programmer!

The Video extended RAM mode is essentially the reverse of the above. The secondary bank is accessed by ANTIC while it remains invisible to the CPU.

In Compatibility mode, both ANTIC and the CPU see the main bank. In Extended RAM mode, they both see the secondary bank. Figure 1 shows how setting the PIA bits affects the CPU and ANTIC access for the various modes.

So what are you going to do with all this new stuff? A practical, applications-minded programmer could create quite a database program with this but as for me, I see an **Eastern Front** with an eight-way scrolling map that just won't quit!

Figure 2

## ENHANCED CARTRIDGE INTERFACE CONNECTOR

	ECI Conn	Description
-----           present 30 pin cart conn           -----	A0-A12	1st 13 Address Lines.
	D0-D7	System data bus.
	R/W*	Processor read/write.
	PHI2	System clock.
	+5V	DC power.
	GND	Ground.
	S4	Chip select \$8000-9FFF.
	S5	Chip select \$A000-BFFF.
	RD4	ROM present.
	RD5	ROM present.
	CCTL	ROM bank control select.
-----           14 pin extension             -----	A13-A15	Upper 3 Address Lines.
	REF	Present cycle is a refresh.
	MPD	Math pack disable.
	RESET*	System reset.
	IRQ*	Interrupt request.
	AUDIO IN	External audio input.
	I/OI*	Chip select at D1XX.
	HALT*	ANTIC halt* signal.
	Extsel	External memory assertion.
	Reserved	Reserved signal line.
	GND	Second ground.
	+5V	Second power.



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The card file is a mail list program which holds up to 200 addresses. The printing format of card file includes continuous lists, labels or envelopes. Files can be printed; all the files from one file number to another; by zip code; by state or by selected files.

#### LETTER WRITER

LETTER WRITER is a preformatted letter writing program. LETTER WRITER can be used for any number of applications involving entering, editing and printing text. LETTER WRITER is designed to be easy to use and does not require extensive training. While LETTER WRITER is not a full word processing system, it performs 90% of the functions used by harder to use and more expensive word processors. DESK SET also contains a program that allows you to combine Card File and Letter Writer for interaction.

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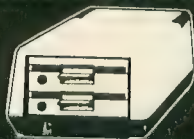
Two drive - double density - 48K required.

## HOME WRITER \$19.00

The HOME WRITER is an easy to use word processor which includes a carefully selected group of functions that are at your disposal immediately. The functions are as follows: SAVE, LOAD, REVIEW, PRINT-OUT, or EDIT. All the popular editing features available on the ATARI Home Computer in direct programming mode are also available with HOME WRITER. You may also search for phrases or strings, load off of either disk or cassette, and number pages automatically. Unlike other small word processing programs, HOME WRITER does not wrap-around when at the end of a line. Right and left margin justification is available for any type parallel printer. 48K.

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- With SMARTDOS you may Copy with query, (eliminates specifying each item individually).
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- SMARTDOS is only 34 single density sectors long and works with all Atari computers with a minimum of 24K RAM.

## FILING SYSTEM \$19.00

FILING SYSTEM allows the user to configure any type of data file imaginable. Examples are recipe cards, mail lists, reminders for birthdays, check-ups, etc., complete inventories (home and business), personnel files, customer call-ups, price list, and much, much more. You may retrieve data using any field or combination of fields. Files also may be saved, sorted, and printed in a preset format that you configure. Uses either a single or a double density disk drive. 24K minimum.

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# CRYPTOQUOTES

Automatic  
"blackboard"  
for codebreaking



by MIKE FLEISCHMANN

*Now your Atari can remove a lot of erasing and tedium from solving code puzzles. Every time you enter a substitute letter, you'll get a global replacement throughout the secret message. This BASIC program works on all Atari computers of any memory size, with disk or cassette.*

I'm a cryptoquote fan. I love to work over these nonsense letter groups trying to find their hidden meaning. You find cryptoquote word puzzles in many newspapers. They are sayings that have had their letters substituted with other letters. Let's say the word "THAT" appears as WFRW; the W stands for T, F for H, and R for A. You try to break the code and find out what the puzzle really says.

Solving cryptoquotes requires trying lots of letter combinations, and this means using lots of paper—or using this program.

## SOLVING PUZZLES

To solve these codes, you look for clues in the letter combinations and word groups. When you think you

know what one word is, you write that word above its corresponding code letters. You then write those letters throughout the rest of the cryptoquote.

If your word seemed to show that the letter W in the cryptoquote was really the letter T, you would search for every W and replace it with a T. This process then leads you to other clues, or to a conclusion that your guess was wrong.

## USING THE PROGRAM

Type in Listing 1, Check it with TYPO II and SAVE a copy. It will function as an automatic blackboard, looking for the letters and erasing entries.

You'll be asked to type in the cryptoquote, which will be displayed in inverse letters. To enter a guess, type the letter you want to change, a space and the letter you want to replace it with. The program will place your guessed letter above the letter to be changed. To erase a guess, type the cryptogram letter corresponding to the guess you want erased.

If you like this program, here are some modification ideas that you might try to work out.

1. Check the input to see if the letter you want as a replacement has been already used.

2. Allow for input of entire letter groups at a time, instead of single letter input.

3. Have the punctuation copied automatically to the replacement line.

4. Speed up the program.

5. Make a game out of the puzzle by installing a counter—try to solve the cryptoquote in as few moves as possible. Have the computer calculate the minimum possible moves.

I'll say goodbye with a cryptogram:

WXXA KGZO! BRJ JXG ERDQ BRFJ  
ERUJ EXGCN NXKDTFW YEQNQ  
UGLLKQN.—YEG RGYEXC

Hint: Y is a T. Good luck.

*Mike Fleischmann is a professional programmer and digital design engineer from Sunset, Utah. His contributions to Antic include our current listing printout program.*

Listing on page 59.





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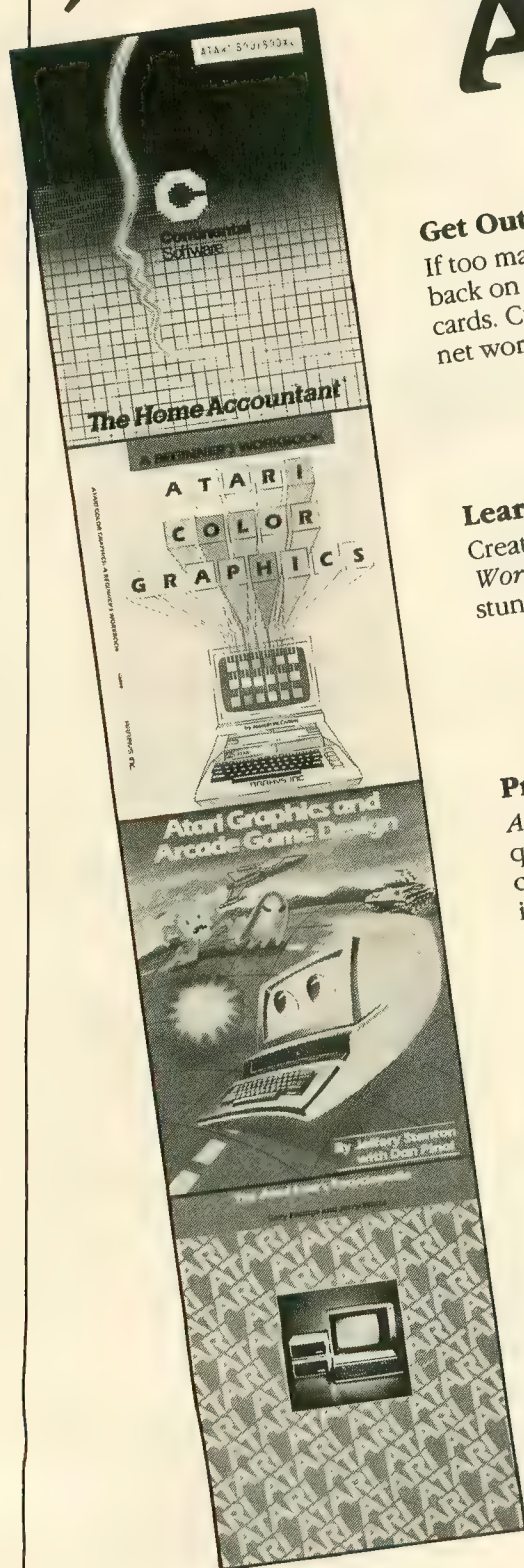
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# STAR VENTURE

by RONALD SAARI

*Newcomers to the Atari computer should find Star Venture a relatively easy game to type. This space opera is created with just a few redefined characters in Graphics Mode 0. It will run on all Atari computers of any memory size, with either disk or cassette.*

"Kid, I've jockeyed rockets from one end of the galaxy to another, but I've never seen anything hairier than the Ghost Station of Antroni. . ." The Sarge's words echoed in my head as a huge metal gate clanged shut behind me!

Yes, I was now locked in the vast outer chamber of the legendary Ghost Station! Beyond my viewport floated rare and incredibly valuable Quontex crystals. All I had to do was fly over them to pick them up—while avoiding those lethal Kirollian Death Pods!

Yet I knew this was my last desperate chance to avoid spending the rest of my life toiling as a slave in the living mudslime of the Antronian glort fields. Shipwrecked in the Antroni star cluster after barely surviving a cataclysmic meteor storm, I needed to come up with plenty of cash for repairs and refueling—not to mention those outrageous Existence Taxes they charge on Antroni!

So I rubbed the sweat from my palms, gripped the control stick, and pushed gently forward. . .

## GHOST STATION

Each chamber of the gargantuan abandoned space station was slightly different. Only some of them had barriers, but every chamber contained nine near-priceless Quontex capsules as well as too many death pods.

But until I collected every capsule from one chamber, the gate to the next remained forever locked. One brush against the walls, barriers or death pods and I'd be nothing but a handful of stardust!

As I carefully explored the station, I was surviving long enough to notice a pattern: After five chambers, it seemed as if I was starting all over again—except it was harder. A lot harder! Whatever long-forgotten alien race built this Ghost Station was crazy, not to mention sadistic as all get-out.

Luckily, I still had some shield energy left. I'd started with 15 shields, but you know sometimes you just can't avoid those killer pods. So you've got to press the old fire button and . . . BLAMMO. . . there goes another pod. Well, I still have enough left for three more shields. And there's gotta be a way out of here with my crystals!

Doesn't there?

Ronald Saari would be happy to have you log onto his New Jersey Atari BBS, the Loony Bin, at (201) 449-3895.



Listing on page 63.

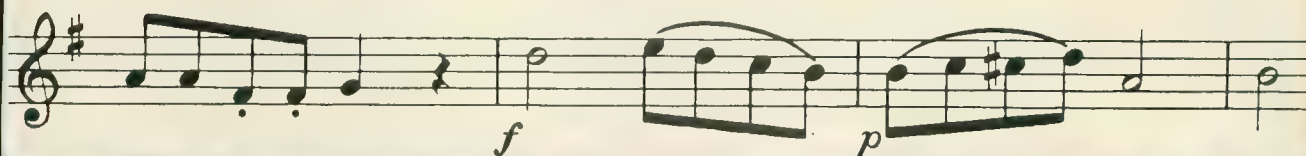




# Guess that Song

How many notes do *you* bid?

by KARL E. WIEGERS



**N**ow, in the privacy of your own home, you can experience the thrills and suspense of being a contestant on one of the classic television quiz shows. Just type in Listing 1, check it with TYPO II, SAVE a copy and get ready to play Guess That Song against your friends!

With this program, your Atari can perform the first ten notes of 40 songs—rock, classical, TV/movie themes, and general.

After entering the names of the contestants, each opponent bids to see who thinks they can identify the song from the fewest number of notes.

*A musical quiz show emceed by your Atari. How many notes do you bid to Guess That Song? This BASIC program runs on all Atari computers of any memory size, with disk or cassette.*

The bidding starts at 10 notes and ends when someone presses [P] to pass. Players alternate bidding and each bid must be lower than the previous one.

The computer will play the number of notes bid. You can press [R] for a repeat playing of the notes (don't press [RETURN]).

## BIG CHANCE

Here's your big chance! Now is the time to guess the mystery song. When you think you have it, press [A] to see the correct answer. Then you must tell the computer if you identified the song correctly. Press [Y] if you got it right, or [N] if not. Use your judgment to determine how accurately a song's title must be stated to be considered correct.

If you won the bid and guessed the song correctly, your score will increase by 11—minus the number of notes in the bid.

For example, a song successfully identified from four notes gives that player seven points. The fewer the



notes, the more points awarded for a correct identification.

However, if the guessing player misses the song, then the score decreases by the number of notes in the bid. When prompted, press any key to go on to another song. The player who passed on the previous song gets the first chance to bid on the next one. Fifty points wins the game.

Correctly guessed songs won't reappear in the current game. A missed tune might pop up again later, though.

## ADDING SONGS

You can replace any of the tunes in "Guess That Song!" with your own selections. You must construct a DATA to replace one already in the program, using the same line number. Lines 4000-4090 are the rock songs, 4100-4190 are classical, 4200-4290 are theme songs, and general songs live from 4300-4390.

The DATA statement for each song has five factors. First is the relative tempo (speed) at which the song is played. Smaller tempo numbers play faster.

Second factor is separation of the notes in the song. Increasing this number gives a more staccato character to the tune, as well as slowing

it slightly. Third comes a string of 10 funny looking characters—which will be explained later.

Fourth is a string of 10 letters, which represent the relative duration that each note is to be played. For example, if the letter A represents an eighth note, then B represents a quarter note, D is a half note, and H a whole note. Finally, the title of the song completes the DATA statement.

Write down the notes in the song and their relative durations. Check *Table 1* and look up the keystrokes corresponding to that note. The pitch values for the SOUND command are also shown. The ten-character string in the third position of each DATA statement is the sequence of keystrokes you found in the table for the first 10 notes of your song.

## TRYING NEW TUNES

To try out your new tune, replace one of the DATA statements in Guess That Song with the entries for your song. It will take some experimenting to get the song to sound right, so let's use a quick way to test the new selection. Add this line to the Guess That Song program:

```
2255 GRAPHICS 0:LN=????
: LIST LN: PRINT "GOTO
2255"
```

Replace the ??? with the line number you are using for your new song. Now type RUN, then press [SYSTEM RESET] without entering player names. Now type GOTO 2255.

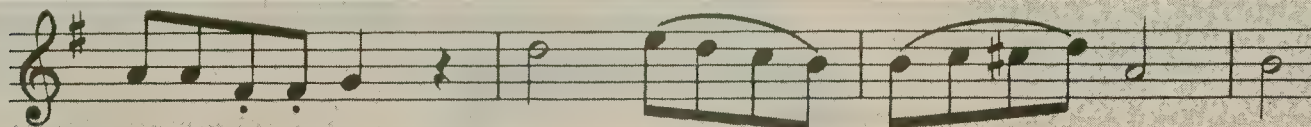
The screen will clear, your new DATA line will be listed on the screen along with a GOTO 2255 line, and you'll hear the song. Disregard the error message which appears. To change any part of your DATA statement, edit the line shown using the cursor keys, and press [RETURN] twice.

Repeat this procedure for all your new songs until they are just right. Then, type 2255 and press [RETURN] to delete line 2255, and SAVE the modified program. SAVE it with a different filename than used for the original Guess That Song so you can keep both versions.

## SAMPLE SONG

As an example, let's do "Red River Valley" in the key of F. The notes are: C F A A A G A G F. *Table 1* tells us to type, in Inverse Video: s 6 [CTRL] P [CTRL] P [CTRL] P [CTRL] P " 6. The complete data statement might look like this:

```
4000 DATA 15,6,SSSSSSSSSS
SS,AABABBAARE,"Red River
Valley"
```



## PROGRAM TAKE-APART

50-80	Initializations	2000-2120	Subroutine for bidding on number of notes	3000-3010	score
110-150	Call subroutines for main parts of program	2200-2260	Play specified number of notes of current song	3100	Get keypress and go on with game
160-220	Decide whether to continue, play again, or quit	2270-2310	Let user play again or see the answer	3500-3680	Subroutine to make sound when score goes up
800-820	Subroutine to make error sound	2500-2550	Play the song	3500-3680	Judge if there is a winner, play tune if yes
900	Subroutine to get a keypress	2800-2840	Let user indicate whether guess was correct	4000-4090	Data for rock songs
1000-1150	Subroutine to get player names	2850-2890	If correct: increase score, play all ten notes, set flag so song isn't played again this game	4100-4190	Data for classical songs
1500-1540	Subroutine to show players and scores, select next song, show category	2900-2910	If wrong, decrease	4200-4290	Data for theme songs
				4300-4390	Data for general songs
				5000	Data for song played when someone wins

continued on next page



Table 1

Pitch Values and Keystrokes for Notes. ([INV] stands for Inverse Video key).

Note	Value	Keystroke	Note	Value	Keystroke	Note	Value	Keystroke
C	243	[INV] s	A#/Bb	68	D	F#/Gb	42	*
C#/Db	230	[INV] f	B	64	@	G	40	(
D	217	[INV] y	C	60	<	G#/Ab	37	%
D#/Eb	204	[INV] L	C#/Db	57	9	A	35	#
E	193	[INV] A	D	53	5	A#/Bb	33	!
F	182	[INV] 6	D#/Eb	50	2	B	31	[ESC] [CTRL] *
F#/Gb	173	[INV] —	E	47	/	C	29	[ESC] [CTRL] =
G	162	[INV] "	F	45	—			
G#/Ab	153	[INV] [CTRL] Y						
A	144	[INV] [CTRL] P						
A#/Bb	136	[INV] [CTRL] H						
B	128	[INV] [CTRL] ,						
C	121	y						
C#/Db	114	r						
D	108	l						
D#/Eb	102	f						
E	96	[CTRL] .						
F	91	[						
F#/Gb	85	U						
G	81	Q						
G#/Ab	76	L						
A	72	H						

Listing on page 57.



## NEW IN THE ANTIC ARCADE CATALOG



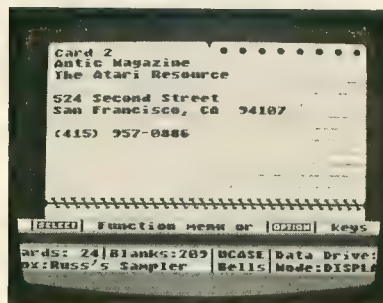
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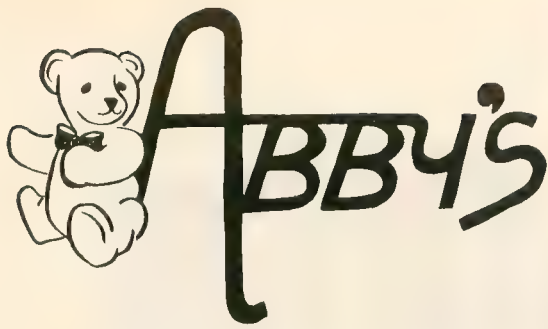
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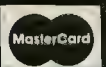
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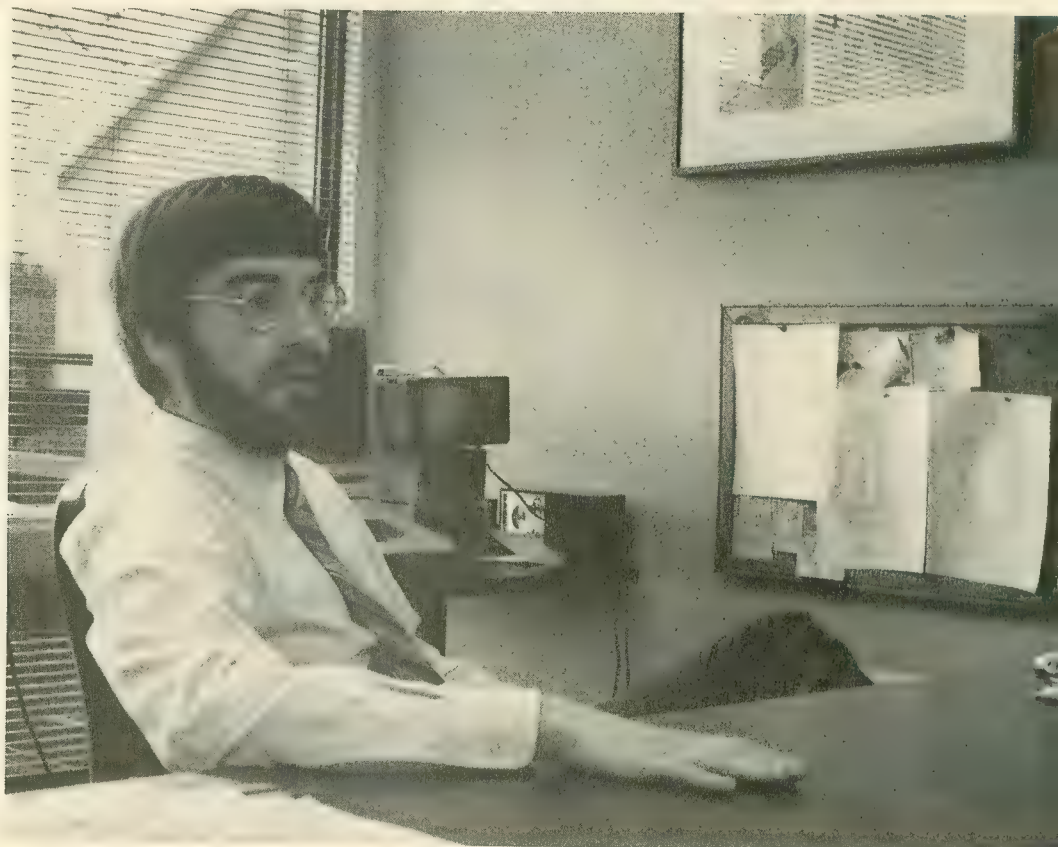




# WAR GAMES

## the story of S.S.I.

by JACK POWELL,  
Antic Technical Editor



**M**ay 8, 1945, V-E Day. The war was over. Robert Billings returned from the Army to finish his education and received his Ph.D. in English, specializing in American war novels. His doctoral dissertation was about *The Naked and the Dead*.

While earning his living as an English professor, Billings pursued an interest in game design. He drilled holes in a piece of wood and drew a map of North Africa on it. He had screws and nuts and bolts that he would put in the holes, and you moved these pieces along and if you

ran into another person's piece it would push through the other side and you knew you had combat.

He had this elaborate system where he used nails as infantrymen, and carved out little tanks, and used marbles with mirrors and you had to roll the marble down and knock over the opponent's nail.

He never published these games, but he played them with his son.

In 1965, Robert Billings brought home a board strategy game that was a little different, *Tactics II*, from Avalon Hill, the first commercial wargame. He showed it to his son and



"When you play a  
wargame, you  
realize you  
wouldn't want to  
be in war."

then taught him how to play. At the age of seven, Joel Billings was hooked.

### STRATEGY ADDICT

"I was trapped for good. That was it." Joel Billings is now president of SSI, Strategic Simulations, Inc., considered by many to be the premier computer strategy game company. He looks remarkably like film director John Landis. "I played through the whole series of Avalon Hill wargames. I definitely was a heavy wargamer for a long time."

Joel's father eventually lost interest

in wargames and Joel lost an opponent. By the time he reached junior high, he discovered that wargamers were a minority. There was no one to play against. In desperation, he joined the school chess club, taught its members wargames, and started his own wargame club. "I had to create the opponents by getting them interested."

But Joel's family moved and when he started high school, he was back to square one. So he began playing by mail. At one point, he was playing nine games simultaneously in two different tournaments.

There was a company offering a service—almost like a dating service—where you paid \$40 for a list of war gamers in your area. Joel paid. "Yeah, finding opponents was tough."

### ECONOMETRICS & COMPUTERS

College came along and Joel found himself with little time for wargames. He was a math-econ major and into econometrics, mathematical modeling and forecasting. He was using computers a lot and began to realize they were perfect for wargames!

Computers could handle far greater detail than board games and eliminate most of the tedious paperwork. But most importantly, the computer was an opponent! 90% of board war gamers played solitaire, moving the troops on both sides of the board. A lot of people out there were looking for someone to play with.

Billings didn't know this at the time. He didn't even know home computers existed. He only knew he wanted to do wargames on computers and "Star Trek" was the only computer strategy game around. And it was on a mainframe.



### SCHOOL OR BUSINESS?

In 1979, he was planning to go to business school, but all he really wanted to do was get into computer wargames. A friend had shown him a TRS-80, so he knew his idea could work. He tried to convince a programmer at IBM, but the man just wasn't a wargamer and didn't believe there were people out there who would buy these hard, complicated strategy games.

"SSI all started with an idea and it was touch and go for awhile as to whether I was going to go to business school or start this company."

Finally, Billings put questionnaires in local hobby shops for programmers interested in wargames. There were two responses: John Lyon and Ed Williger. They were both programmers but, more importantly, they were *wargamers*. Around this time, a venture capitalist introduced Billings to Trip Hawkins, who is currently president of Electronic Arts. But back then, Hawkins was a marketing manager for Apple. He convinced Billings that Apple was going places. "We were very lucky that way or we could have gotten started doing TRS-80 games."

John Lyon was a wargamer into miniature figures. He had been a programmer since the '60s but had done nothing in BASIC and had never worked on a personal computer. Ed Williger was more of a wargamer than Lyon, but also had no experience in BASIC.

Lyon wrote SSI's first game, **Computer Bismarck**, and Williger wrote the second, **Computer Ambush**. The first version of Computer Ambush for the Apple was incredibly

continued on next page





**July's**  
**Antic**  
**ACTION**  
**EDITION**  
includes a  
**DOUBLE-**  
**SIDED**  
**DISK!**  
Bonus second  
side contains  
**ALL 6**  
**WINNING**  
**ILLUSTRATIONS**

from the ANTIC cover  
coloring contest, as seen  
in the June, 1985 ANTIC  
issue.

(To view some of the micro-  
screens you'll need the software  
from KoalaPad or Atari Touch  
Tablet. Fun With Art software is  
required for one picture.)



slow. It could take three hours to process one turn! "It was just terrible." But it was one of their first products and they needed the money.

### SILICON STRATEGISTS

Today, SSI has 60 games and sleek, modern offices in the Mountain View fringe of Silicon Valley. Serious computer wargamers consider it a company in a class by itself.

There are, perhaps, four categories of computer games: arcade, adventure, fantasy role-playing, and strategy-simulation. SSI seems to be a solid Number one in the fourth category. There may not be as many wargamers out there as arcade fans, but wargamers form a hard core of faithful consumers.

The typical elements of a wargame include statistics, a detailed combat map, statistics, charts, troop allocations, statistics, historical accuracy, and more statistics. SSI games are rated from introductory through advanced. Don't attempt an advanced SSI game if you're not a hardened combat veteran! The documentation alone will leave you gasping and bloody on the battlefield. Billings recommends *Eagles* or *Field of Fire* as excellent introductions to the genre.

### WAR PAYS!

Most SSI games are written in BASIC then compiled for speed. Almost all their games are written by outside contributors. Of the 12 games published last year, six were by regular contributors—such as the prolific and popular Gary Grigsby—but six were by complete newcomers.

"There's a decent amount of money to be made. A war game may bring in \$10–20,000 for the programmer." Interestingly, Atari people are heavily into wargames. "Computer for computer, there's a higher percentage of Atari owners that play wargames than there are Apple or Commodore owners."

SSI has developed in-house graphics tools—Graph-Pak and Square-Pak—which speed map design and handle special algorithms, such as "line-of-sight checks", which pro-

grammers find tedious. Utilities such as these simplify transfer between computers and "allow us to crank these games out."

Billings referred to some of their games as "clone games." By keeping the core system and changing the weapons and the map, a new game is created. Gary Grigsby is their most prolific author partly because he's mastered their utility tools and the concept of clone games. "New math, new database, and you've got a whole new game."

### WHO PLAYS?

Some may think wargamers are warmongers—right-wing hawks with a love of weapons and power. Billings says surveys show most wargamers are well educated and have a relatively high income. Not surprisingly, 99% of wargamers are male. Using one of his own games, *President Elect*, Billings rated himself, on a scale of 0-Conservative to 100-Liberal, as 60 overall. He was 83 on social views and 50 in foreign affairs. "When you play a wargame, you realize you wouldn't want to be in war."

But the fascination is there. We asked what turned him on: "Charts. Charts with weapons. A list of all your weapons, each tank—about 50 different tanks, and anti-tank guns, the range and the speed of the gun, and the maximum penetration."

Billings is particularly excited about a new SSI game called *Colonial Conquest*. It's a six-player game, where you play one of the major world powers during the period of your choice: 1880 or 1914. The powers are U.S., Japan, Russia, Germany, France, and England. You're out to control the world. Total global dominion. "It's fun to go out there and conquer the world on the screen."

### RECOMMENDED READING

*Sorcerers & Soldiers: Computer Wargames, Fantasies and Adventures*, by Brian Murphy. \$9.95. 226 pages, paperbound. Creative Computing Press, 39 East Hanover Avenue, Morris Plains, NJ 07950. 1984.





bonus game

# DARK STAR



by MICHAEL MITCHELL

*Fly the Darkstar and wipe out enemy alien bases. There are two versions of this game, one is written in BASIC and the other is in ACTION!. Both will run on any Atari of all memory sizes, with either disk or cassette. But the ACTION! listing requires the ACTION! cartridge from Optimized Software Systems. Antic Disk subscribers will find a run-time file of the ACTION! version on their disk. Go to DOS and load DARKSTAR.EXE with the L function.*

The year is 2001, you just graduated from high school and you're bored. All your friends headed for college or fulltime jobs, they seemed to have things planned out pretty well. You had dreams of medical school, but there was just no money for that kind of thing. So, what do you do?

You join the U.S.A.F.

## IN LUCK

Things could be worse. It turns out you have a remarkable aptitude as a fighter pilot. But just as you soar to the top of your class, aliens from the planet Spectra land on Earth and begin installing military bases all over the planet.

Because of your stupendous flying abilities, you are selected to pilot the Air Force's new secret weapon: Darkstar. Your mission is to destroy as many enemy bases as possible.

## FLIGHT INSTRUCTIONS

The controller on Darkstar is surpris-

ingly primitive for a new secret weapon, and very similar to an antique Atari joystick. Just move the crude device in the direction you wish to fly the plane. The object is to pass your jet over as many of the enemy bases as possible, spraying them with your wake of radioactive wastes.

You're doing fine until you encounter one major problem: the controls have jammed. As a result, Darkstar continues to spray wastes nonstop, thus preventing you from crossing your own path. If you do touch the glowing contrail, your jet will be instantly damaged. Darkstar can withstand three blasts of radioactive waste. Upon the third blast, Darkstar will be terminated—as will you, the pilot!

## NOT ENOUGH

As if you didn't have enough problems, some wimpy, kneejerk ecology group is up in arms just because your radioactive trail has permanently rendered uninhabitable a large number of small farms plus the entire state of Missouri.

Reacting to the pressure, the President interrupts his vacation and orders NASA to erect a deadly force field around your area of operation, effectively converting your flight into a kamikaze mission.

## MERIT SYSTEM

But you're in this for the glory, and you will receive

30 merit points for each alien base destroyed.

However, you can keep obtaining new Darkstars at the end of each mission, simply by pressing the joystick button. If you somehow keep flying until all the aliens flee back to Spectra, maybe the scientists will figure out a way you can escape through the force field...

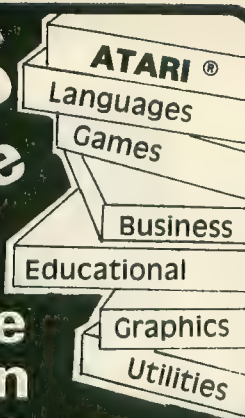
## TYPING IT IN

Listing 1 is the ACTION! version of Darkstar and Listing 2 is the BASIC version. Although both games are similar in structure, they are not identical. The BASIC version has a simpler title screen, a different explosion routine and—more importantly—is much slower so your scores will probably be higher.

continued on next page



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If you have the ACTION! cartridge, type in Listing 1, SAVE it and then compile and RUN it. Those with BASIC should type in Listing 2 and check it with TYPO II. SAVE a copy before RUNning it.

### ACTION! ANALYSIS


The source code is pretty well remarked and consists of only five procedures:

1. PROC WAIT( ) Pauses according to the CARDinal value passed within the parameter.
2. PROC TITLE( ) Prints the title, then rotates the screen colors.
3. PROC BOX( ) Randomly draws enemy bases.
4. PROC MAIN( ) The heart of the program. It sets graphics to mode seven, checks for collision, checks the joystick, and moves the player.
5. PROC START( ) Since MAIN( ) is called within itself, START( ) is used to isolate the initial TITLE( ) call.

*Michael Mitchell is a San Francisco high school student who wrote the upcoming Antic Public Domain release **Rainbow DOS** and is sysop of Twilight Zone BBS at (415) 755-0375.*

Listing on page 60





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# SLIDE

## The 24-puzzle: can YOU program a solution?

Program by MARK MOORE

Article by MICHAEL CIRAOLLO, *Antic* Associate Editor

*A computerized version of the 24-tile puzzle grid, Slide is easy to type in and a good starter for advanced programmers who want to try their hands at intelligent game design. Written in BASIC, Slide requires a joystick and 16K RAM on any Atari, disk or cassette.*

**T**ile puzzles—grids of 8 tiles in a 3 x 3 arrangement or 24 tiles in a 5 x 5 arrangement—have been around a long time. Can you solve the 24 Puzzle? Can your Atari solve it? For an introduction to the design of intelligent games, read on. You'll find a jumping-off point for further programming and research. (Also be sure to read the article about Computer Chess in this issue.)

If you only want to play the game, type in Listing 1, check it with **TYPO II**, and **SAVE** a copy. Use the joystick to move the cursor in the desired direction. Move the lettered tiles by pressing the joystick button. You can move a tile into any vacant square.

When you get the tiles in alphabetic order, press the **[SPACE]** bar. The computer will verify your result—the time it took to complete the puzzle, or an obnoxious razz signifying that you need to try again.

### INTELLIGENT GAMES

There are two types of "intelligence" you could use to set your Atari solving the 24 Puzzle. You could use an algorithm, which is a logical set of steps for solving a specific problem (or showing if no solution is possible). Since the program would have to examine every possible move until the best solution was discovered, this would be very slow and possibly beyond the limits of a computer's memory.

The alternative is devising a heuristic problem solving technique. This means developing a set of rules that cut out a lot of the false moves. Most electronic games favor heuristics since they require less moves, which makes them faster and more memory-efficient than algorithms.

If you are going to write a program to solve the 24 Puzzle, you might wish to use a common heuristic device called a "tree."

The game's starting position is called the "root." Spreading up from the root are all the legal moves, produced by a subroutine called a legal move generator. Each legal move, in turn, begets another generation of possible moves. It is up to the computer to evaluate each end position to see if that position is near a solution.

Intelligent game programs use a device called an evaluation function

to supply a numerical score for each end position. Such a function for the 24 Puzzle might count the number of vertical and horizontal tiles between the current position and the target position. For instance, the "A" tile might be three spaces away from the upper left corner. Add this to the "B" tile's distance of five from its target position. Add this sum to the position for the "C" tile, and so on.

The score resulting from the evaluation function tells the computer which branches are closer to a solution; the program can then disregard the least promising result with a process called "pruning."

### SOLUTION STRATEGY

Now we have a strategy:

1. The program will generate all possible moves from the root.
2. It will then evaluate each position to see how close a position is to the target.
3. Next, it will draw a new tree, based on the most promising results of the previous tree.

Each time the program draws a new tree, or picks the best possible position from a choice of branches, it is determining its next move.

In the world of electronic gaming,

continued on page 50



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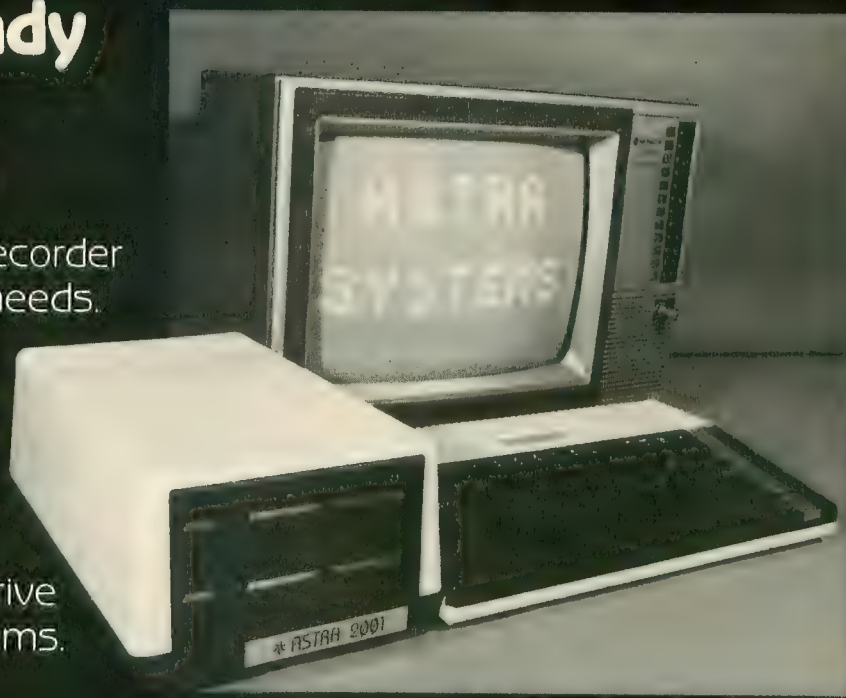
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*"You don't seem to be playing your usual game today, Dave."*

—HAL 9000, from 2001

# Computer CHESS Programming

by MICHAEL CIRAOLLO, **Antic** Associate Editor

Computers that play chess have fascinated both the public and programmers ever since a large IBM 704 played two legal but bumbling games at a 1957 Dartmouth Conference on Artificial Intelligence. (For more about designing intelligent games, see "Slide" in this issue.)

In this article, we examine the current state of computer chess programming—as represented by the **Odesta Chess** software for Atari (Odesta Corp., \$69.95) and the **Turbostar 432**, an expert-level dedicated chess computer (SciSys, \$350) which uses the same 6502 microchip as the Atari.

During our research, we discovered that Atari computers play a more than passable game of chess. We matched the Odesta program against the Turbostar at levels ranging from easiest to hardest. The more expensive Turbostar consistently won, but the Odesta gave it a tough battle each time. And both play chess well beyond the skill of most non-competition human players.

## PLAYING GAMES

The basic approach to designing intelligent computer games is not hard to understand, although the programming itself isn't easy. So says Larry

continued on next page



Atkin, who programmed Odesta Chess and helped write the groundbreaking CHESS program at Northwestern University. Successive versions of CHESS held the Computer Chess Championship throughout the 1970s.

Atkin said that most chess programs represent variations of a "tree" search pattern.

The computer "sees" the board as an 8 x 8 array of numbers, with the pieces represented as a positive or negative number.

Move selection involves three modules—a move generator, an evaluation function and a quiescence function.

The first module produces a look-ahead tree of possible moves starting from a given position and lists all situations that could possibly "branch" from a move.

## CHESS MODULES

The program then develops a second generation of possible branches, and so on. Obviously, with millions of possible chessboard situations, even a Cray XMP supercomputer would run out of processing space quickly. That's why game design requires additional modules.

The second module is called the evaluation function. It is here that knowledge of chess strategy and concepts is put into an algorithm—a series of steps by which a computer can solve a given problem.

An evaluation function program might compare the two opponents' material forces, mobility, pawn strength, king safety, control of central squares, and so on. This function looks at each "node" (possibility) on the tree to analyse specific board positions.

The more chess sophistication you put into the evaluation function, the more processing time the program takes. So there is a trade-off between the number of nodes that can be examined and the complexity of the evaluation module.

Because most of the nodes on a tree aren't optimum positions, the program also needs a section to evaluate

the end position of the various branches and determine what branches are worth pursuing. This module is the quiescence function—it "prunes branches" (eliminates possible moves) that aren't promising, thus freeing computer memory.

This complex process results in the computer making a move, and then developing a strategy for the situation created by the move.

Most dedicated machines currently use the same chip as the Atari, the 6502 microprocessor. Software is compiled into assembly language from C or Pascal. "C keeps you closer to assembly language, Pascal protects you from too many of assembly

well as a National Master. Active as a professional chess player for five years, Kaplan also holds a master's degree from U.C. Berkeley in computer science.

## MOVING UP

Chess computer advances are coming quickly in both hardware and software, believes Kaplan.

There was a quantum leap between the previous SciSys Superstar machine and the current Turbostar, Kaplan contends. The Turbostar is much faster.

Kaplan said there's been considerable improvement in designing efficient search trees, with improved



language's tricks," said Julio Kaplan, president of Heuristic Software in Berkeley, California. Kaplan programmed the Turbostar for SciSys.

## NEW APPROACH

Although "brute force" is the proven approach to programming chess and other games, the philosophy is changing, according to Kaplan. He favors a "selective search" instead.

"You rely on special knowledge for evaluating each node," Kaplan said. That is, the computer starts playing more like a grandmaster and less like a computer. The search is narrower, but the "thinking" about various positions is more intensive.

Kaplan brings considerable "special knowledge" to chess programming—the last time he checked, he was ranked "about 73rd in the world." He was World Junior Chess Champion as

pruning. "It's a leaner program," Kaplan said.

Kaplan has improved the end game, an area traditionally weak in machine play because the consequences of any move went beyond the ability of the search tree, and those consequences are greater in the end game than in the opening.

To improve a chess program, you evaluate the game the program is playing. Kaplan thinks about what pieces of knowledge are missing for the computer's evaluation of a certain situation node.

That information then must be expressed in an algorithm. But that algorithm can't just be added onto the program. Kaplan must understand how all the elements of the program affect each other.

Finally, he must analyse the impact of the added algorithm on the speed



of the program, which is frequently measured in nodes per second—how many situations can the program evaluate in one second.

## THE FUTURE

With the dropping price of ROM (Read Only Memory) chips which store the game program, larger programs for the high-end machines will be available at lower prices, Kaplan predicted. In the \$60–80 range, machines are much smarter than they were three years ago.

The software area is especially improvable, Kaplan believes. Of the four leading companies, two are using brute force exhaustive search—ideal for finding tactical mates in, say, four moves.

The other companies, including SciSys, are using selective searches, which play some positions very well, but still make embarrassing moves on others.

"I think there will be a master-level microcomputer based chess program within two years," Kaplan predicted.

"I'd like to see these machines provide entertainment, user interest and education." Ideally, the machine should tell you more about its own thought process and coach you on your game. Playing a computer chess program will be like playing HAL in 2001—it can tell you when your game is off... and why.

"A brute force machine can't explain its thought process. Only a selective search can. This makes it more interesting as a chess player," Kaplan said.

The better micro programs currently beat the mediocre mainframe programs, Kaplan said. The day is not far when there will be "upsets" between micros and mainframes—by the end of 1986.

The next generation of Turbostar, which should be available by the end of this year, will have a tactical knowledge that surpasses the ability the brute force programs are likely to have by year's end. And new machines will be upgradeable with plug-in chips!

## RECOMMENDED READING

**Computer Gamesmanship**, by David Levy. \$12.95. 272 pages, paperbound. 1983. Simon and Schuster.

**Chess Skill in Man and Machine**, by Peter Frey. \$18.95. 335 pages, 1984. Springer Verlag.

**How to Get the Most from Your Chess Computer**, by Julio Kaplan. \$9.95. 1983. RHM.

## MANUFACTURERS

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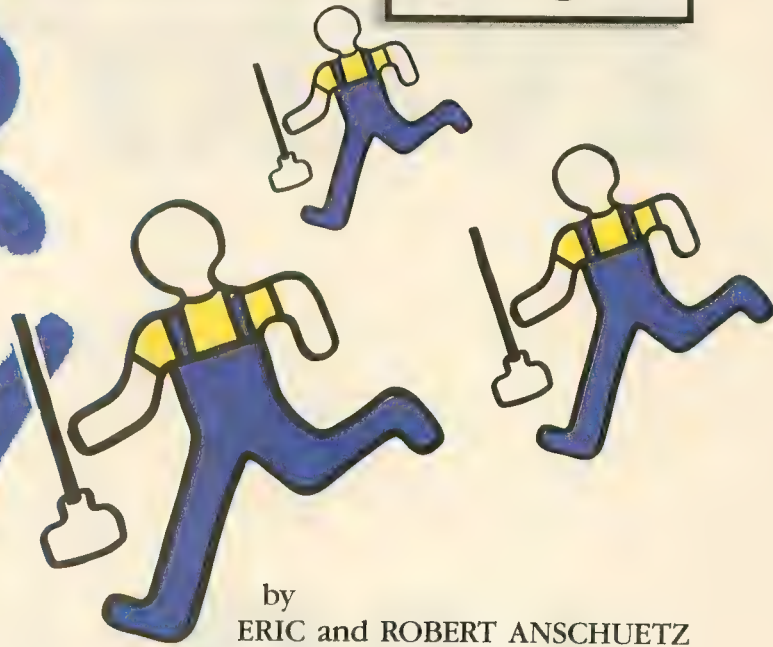
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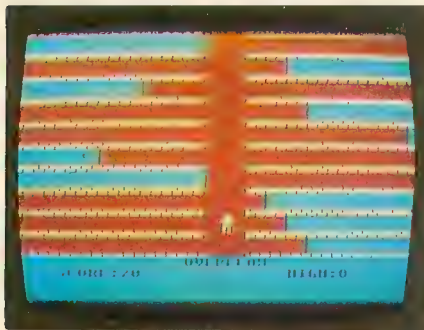


# OVERFLOW

Only your plumber's helper  
can save you!



by  
ERIC and ROBERT ANSCHUETZ  
and JOHN WEISGERBER



*Discover the thrills and excitement of being a Sanitary Engineer (plumber) as you enter a maze of killer pipes. This BASIC program works on all Atari computers of any memory size, with disk or cassette. Just type in Listing 1, check it with TYPO II and SAVE a copy before you RUN.*

without scaring the guests. Of course, sewage problems tend to get worse as a party wears on—especially if guests discover that the duck pate has disagreed with them.

With apologies to our favorite etiquette columnist, this program uses players for the plumber, plunger and central pipe. All vertical motion is produced using a string printed at the correct place in memory. The main graphics mode is ANTIC 5.

An unusual technique here is the use of basically the same memory address for every line of the playfield graphics. Each line has its own LMS and the high byte on every one is set to the same page. The water is moved back and forth by incrementing the low byte on each LMS. The increment for each line is held in a one-dimensional array. If a column of sewage is hit by the plunger, the increment's sign is simply reversed.

*Members of the noted Antic game programming team of Anschuetz, Anschuetz, and Weisgerber tell us that they are currently attending Eastern Michigan University and would like jobs as programmers when they graduate.*

Listing on page 62



Dear Miss Goodmanners:

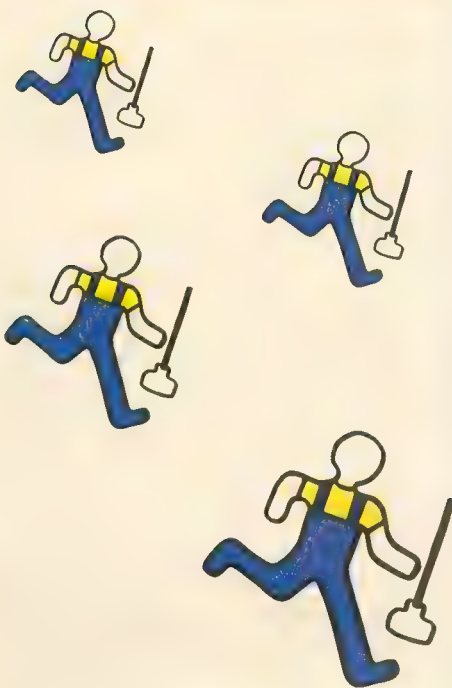
Is there a correct way to stem a rising tide of bathroom back-ups while entertaining distinguished guests in my 49-room mansion?

Concerned

Dear Concerned:

Miss Goodmanners prefers the term water closet. . . Sadly, overflow problems are part of our modern age and must be dealt with firmly and quickly. Miss Goodmanners would never commit the faux pas of embarrassing guests during a sumptuous banquet by confronting them with a mass of raw sewage.

Miss Goodmanners would award you credit for decisively hurling your plumber's helper at each of the overflowing water closets, while tactfully running between pipelines





# EVERYTHING

YOU  
WANTED  
TO  
KNOW

# ABOUT

EVERY

# D.O.S.

*Including the  
brand-new  
DOS 2.5*

by ERIC CLAUSEN

**W**hy in the world are there so many versions of DOS (Disk Operating Systems)? Flip through your favorite Atari magazine (*Antic*, of course) and you see ads and reviews for products with names that end in DOS. Who uses them, and why? The following will answer key questions and point out some of the good and not-so-good points of the major Disk Operating Systems available for the Atari computer.

For those of you who are new to the Atari, DOS 2.0S has been the most widely used DOS since its introduction in 1980. It is a good, reliable product. But the reason it is widely used is not so much because it is superior but because it is the "official" Atari DOS and was the first major DOS released for the Atari line of computers. Most major Atari software vendors conformed to it, so it became the "standard" by default, independent of merit.

If you wish an introduction to Atari DOS 2.0 and some of its functions, please refer to "Why You Want DOS 2" (*Antic*, April 1985). For those experienced in DOS 2.0, and yearning to explore greener pastures, read on.

## ATARI DOS 2.5

This long awaited product, successor to Atari 2.0, will become the new 'official' Atari DOS. It was written by the same group of people (headed by Bill Wilkinson of Optimized Systems Software) who are responsible for Atari BASIC, DOS 2.0, BASIC A+, BASIC XL, DOS XL, ACTION! and other top-ranked Atari products.

DOS 2.5 supports both single density and the enhanced (dual) density mode on the Atari 1050 disk drive. If you format a disk in your 1050 drive with this DOS, you'll find that you now have 1010 sectors (129K) of available disk storage. This represents



a 43% increase in capacity over DOS 2.0. DOS 2.5 maintains the use of 128 byte sectors but increases the number of sectors per track from 18 to 26.

Most importantly, DOS 2.5 maintains file compatibility with DOS 2.0. Thus if you have a 1050 drive, you can boot up DOS 2.5, format a disk, directly copy your DOS 2.0 files on to the disk and have considerably more room left over. All this with no hardware modifications to the disk drive.

Otherwise, this new DOS looks and acts exactly like DOS 2.0. The menu will be reassuringly familiar as there has been only one addition: Option [P] on the DOS 2.5 menu will allow 1050 disk drive users to force a single density disk format instead of the default enhanced density.

Those of you with 810 drives need not despair, this DOS is for you too. Although you will not be able to use the enhanced density feature, you can boot DOS 2.5 disks that were formatted and written in single density on 1050 drives. The way that DOS 2.5 handles this is to "hide" files from the 810 drive that cross over sector 720, which is normally the last DOS 2.0 sector. If you completely fill a DOS 2.5 disk (1010 sectors) on a 1050 and then check the disk directory at some point you will see files listed like this:

```
FILE1.BAS    025
<FILE2.BAS>  025
```

This tells you FILE1.BAS is entirely contained within the first 720 disk sectors and can therefore be accessed by an 810 drive. The file(s) with the "< >" characters around them are NOT accessible with an 810 drive because they are physically located where the 810 drive can't read them. So if you have an 810 and ask your friend with a 1050 to copy some of his files, make sure the files you want don't have < > around them!

Other features of DOS 2.5 are:

1. Though the directory of an empty formatted disk will read "999+ FREE SECTORS". You really have 1010 sectors.

2. Option J (Duplicate Disk) now formats the destination disk before copying.

3. DOS 2.5 will allow 64K of memory in the new 128K Atari 130XE computer to be used as a ramdisk.

4. A file conversion utility to convert Atari DOS 3.0 files to the DOS 2.5 format.

5. A utility to create autoboot basic programs.

6. An un-erase capability to retrieve accidentally erased files.

7. You can easily turn write verify on or off and change the number of disk buffers, without resorting to POKES.

8. The ability to test for bad sectors—whole disk only.

Options 3 through 8 are not directly accessed through the menu but are included on the DOS 2.5 disk as binary load files.

One thing that concerns me, as a user, is the lack of a disk utility program for enhanced density disks. In some preliminary checks, I've found that DiskWiz 2 will read all enhanced density sectors out to sector 1023 (the difference between 1023 and 1010 is taken up by the boot and directory sectors where program data is not stored). It won't trace or map sectors that run past sector 720, however.

I hope some company or individual will soon produce a full-featured disk utility compatible with this highly impressive new DOS 2.5.

## ATARI DOS 3.0

DOS 3.0 is the DOS Atari has been shipping with the 1050 disk drive. It supports enhanced density but, unfortunately, will not read DOS 2.0 files directly and vice versa. DOS 3.0 permits conversion from DOS 2.0 files to DOS 3.0 format, but disastrously no provision was made to go the other direction.

Once you converted your DOS 2.0 files to DOS 3.0, you'd never be able to share your programs with an 810 drive owner. **Antic** published a method to convert back to DOS 2 (January 1985) and there are some public domain utilities around. Check your local users group, Compuserve SIG\*Atari, or wait for DOS 2.5.

The DOS 3.0 file management is a

more serious flaw. It stores files in "blocks" of 1024 bytes as opposed to the DOS 2 (and compatibles) 128 byte "sectors." This can be wastefully inefficient. If you save a file of 1025 bytes (one block plus one byte), DOS 3 will save it as 2 blocks, wasting 1023 bytes of disk space!

This product should be avoided. It's a shame so many newer Atari users have been saddled with it.

## DOS XL 2.3

DOS XL is a superb product, written and marketed by Optimized Systems Software (OSS). Though no one DOS is ideal for the needs of all users, this product comes close.

DOS XL is shipped with both single and double density versions on the disk. It directly supports both single and TRUE double density.

**DOS XL includes some features which make it truly unique**

True double density utilizes 256 byte sectors as opposed to the 128 byte sectors of single density, with the number of sectors and tracks remaining the same. Therefore, the storage capacity of a double density disk is 256\*18\*40 bytes or 184,320 bytes, which exceeds the capacity of the enhanced density mode of the 1050 drive by more than 50,000 bytes—a substantial difference by anyone's standards.

Of course, you must have a disk drive capable of double density to take advantage of this increase, and to date no Atari-manufactured drive has had true double density capability. Owners of other drives such as Rana, Indus, Trak, Percom and Astra already enjoy the benefits of this extra storage.

Atari 1050 owners will find available at least two hardware upgrades to true double density. They are manufactured by Happy Computers, Inc. of Morgan Hill, Ca. and by ICD, Inc. of Rockford, Ill. These modifications take advantage of special DOS's which we'll look at in a bit.

continued on next page



DOS XL includes some features which make it truly unique. Three versions of DOS XL are included on the master disk. Each supports different memory configurations possible on Atari computers in order to maximize free memory for programming purposes.

As shipped, DOS XL is configured for use on any Atari with Atari or OSS BASIC. Another version of DOS XL on the disk is intended for use in conjunction with the bank selected OSS SuperCartridges (BASIC XL, ACTION! and Mac/65). This allows the DOS to occupy the RAM "under" the SuperCartridge, effectively increasing the amount of free RAM by 4608 bytes in a 48K Atari 800. Owners of 800XLs can utilize yet another version of DOS XL which takes advantage of the extra RAM available on the XL machines under the OS.

DOS XL can be either menu driven, like Atari DOS 2, or command driven like Apple DOS, CPM and UNIX. People with a wide variety of computing backgrounds can therefore feel comfortable almost immediately with this product.

A menu driven system provides prompts and doesn't require that the user memorize numerous DOS commands. A command driven system is far faster once the user has mastered the commands. Also, the command mode occupies about 2K less memory since a menu doesn't have to be loaded into memory.

DOS XL supports numerous "intrinsic" and "extrinsic" commands. Intrinsic commands are those which can be issued in the command mode and do not require disk access (they reside in memory). Examples include: disk directory, change default drive number, protect and unprotect files, process batch file, run cartridge, erase file, etc.

Extrinsic commands are commands whose code resides on the disk, not in RAM. Examples include: copy, initialize disk, menu, etc. Actually, *any* binary load file, with the .COM (command) extender, can be a DOS XL extrinsic command.

Many long-time users of Atari DOS find the use of extrinsic commands irritating because they are not used to

the requirement of having the various extrinsic command files present on the disk along with the DOS itself. A simple solution is to make a copy of DOS XL including only the files for extrinsic commands used most often.

Another complaint expressed is that all these extra files eat up too much disk space. There are three ways around this problem: Include *only* the files you need on your working DOS disk, use 2 disk drives (This allows you to get by with no DOS files on your disk, assuming you have a master disk in one of the drives), or get a true double density drive and increase your available space.

DOS XL also supports "batch processing". This allows you to put together a special text file made up of valid DOS commands and file names, then have those commands run in sequence by giving only one command.

## Documentation for DOS XL is extensive

Batch files differ from extrinsic commands in that they contain only text and have their own special extender, .EXC (execute). Extrinsic commands and other files called by the batch file must be present on the disk for proper execution. In a special case, much like the familiar AUTORUN.SYS file, a batch file with the name "STARTUP.EXC" will execute when the disk is booted. This allows the user to autorun BASIC programs, something not easily done with Atari DOS 2.0.

OSS also has available special versions of DOS XL which directly support the Axlon Ramdisk, the Mosaic 64 board, and the Bit-3 80 column board. This makes it possible to program BASIC XL, ACTION!, and MAC/65 in an 80 column format.

The Axlon Ramdisk version of DOS XL automatically recognizes the Ramdisk, formats it (with 883 free sectors) and defines it as drive 4. This is the easiest, most efficient utilization of the Ramdisk I have seen. Most DOS's require special additional hardware to utilize a Ramdisk, such as the Omnimon or the Integrator Board. I'm surprised Axlon and Mosaic haven't

licensed DOS XL from OSS and distributed it with their hardware.

Documentation for DOS XL is extensive and well written, and customer support is excellent. Additionally, OSS has begun including BUG/65, an assembly language debugger, with DOS XL.

DOS XL is a well thought out, highly professional product worthy of your attention.

## SMARTDOS 8.1D

SmartDos by Astra Systems is the DOS that Astra has been packaging for some time with its own drives. Even though it is packaged with Astra drives, it is compatible with all Atari drives and all Atari DOS 2 compatible DOS's.

This is menu driven DOS with some notable differences from Atari DOS 2. It supports single and double density and displays a "status" line above the menu indicating which drives are active, their density and the size of free memory.

SmartDos has some useful menu additions that allow sector copying, drive speed checking, bad sector testing, write verify on/off, and drive reconfiguration (single to double density and vice versa). You're given the option of having DUP.SYS (the Disk Utility Package) resident in memory, though this uses considerable memory.

If you've ever needed a double density sector copier, now you've got one. SmartDos will copy 121 double density sectors per pass on a 48K machine, so several swaps are necessary to copy an entire disk (with one drive).

Like Atari DOS 2, there are no extrinsic commands to keep in mind. SmartDos does not require any special hardware and does not directly support any. It seems to have difficulty working with an Axlon Ramdisk, even with Omnimon installed. But this will be a minor concern to most users.

In general, this is an easy to use product, with more than just the basics.

## SPARTADOS 1.1

SpartaDos is more of a specialty product than those previously men-



tioned. It is specifically designed to be used in conjunction with a hardware modification for the 1050 drive called the ICD Doubler. This modification is one of two which will convert the 1050 to true double density.

In addition to supporting double density, SpartaDos, with the ICD Doubler, supports ultra-fast disk I/O. Incidentally, Happy 1050's also support SpartaDos's ultra fast disk I/O. Not surprisingly, SpartaDos and the ICD Doubler are marketed by the same company, ICD, Inc. of Rockford Ill.

The other "specialty" use for this product lies in its ability to operate with various drive formats simultaneously. This should be of interest to ATR8000 owners who are running mixed 5 1/4" and 8" drives, single or double sided, single or double density.

SpartaDos is a command driven DOS featuring intrinsic and extrinsic commands and batch processing. It also features time and date stamping of disk files and multiple subdirectories with 128 file names per directory (double the usual number). There is an 'unerase' command, which allows you to recover a previously deleted file—if you haven't written to the disk since deleting that file.

All of these features sound great, and they are—if you have the hardware. If you don't have a modified 1050 drive or an ATR8000, you may find few actual advantages to this product.

SpartaDos is not directly compatible with disk files created with any other DOS for the Atari. However, a file copy utility is included which will convert from DOS 2 type files to SpartaDos and back again. This utility will also copy between densities with ease. The only DOS with which this utility currently will not work is Atari DOS 3. SpartaDos is an intelligent copy utility which does not have to be told in advance what file type or density it is copying to or from.

There are four versions of SpartaDos included on the master disk, two standard DOS's, one for normal drives and one for hardware modified drives, and two "read only" versions for normal or modified drives.

The idea of a read only DOS is a bit unusual, as most of us sooner or later actually need to save something onto disk and "read only" means just that, it will read files but not write them. The option is provided because it takes up less memory, loads faster, and is ideal for loading games where writing to disk is not important. The standard version supports all of the SpartaDos features.

The high speed versions of SpartaDos, when used with the appropriate hardware, provide extremely fast disk I/O. An improvement in reading and writing speed of 2 to 4 times over Atari DOS 2. SpartaDos is comparable to Happy Enhancement WarpDos in speed. This increase in disk I/O is made possible by the additional disk hardware which, among other things, increases the data transfer rate on the serial bus between the drive and the computer from 19.2k bps to over 40k bps.

**All of these features  
sound great, and they  
are—if you have the  
hardware**

Tremendous flexibility is provided for ATR8000 owners who may be using different types of generic disk drives. Special drive formatting is provided under SpartaDos with choices of 35, 40, 77 and 80 tracks, single or double sided, and single or double density. Additionally, a special RS232 handler is provided for use specifically with the ATR8000.

Multiple subdirectory capability is another unusual feature of this product. If, for example, you have a large number of game files which need some organization, you would do the following: When SpartaDos asks you for the "volume" enter GAMES. Create two subdirectories, call one BASIC GAMES and the other BINARY GAMES. Under each of these two subdirectories, create two more subdirectories called ARCADE and EDUCATIONAL.

You now have a single disk on

which you can store, under the appropriate categories, basic arcade games, basic educational games, binary load arcade games and binary load educational games. All the directories are linked and each directory can contain up to 128 subdirectories or file names, and so on.

This is only useful to people who have large capacity drives since all the programs that fit under the subdirectories that you create eat up disk space rapidly. Ideally, a large capacity hard disk would be what you want to take advantage of this capability—if one were available.

SpartaDos is not without its problems. Error handling could be improved. If you call a non-existent cartridge you get a system crash. If you attempt to format a write protected disk, the drive keeps spinning until you turn it off. And you won't get an error message if you tell SpartaDos to format your 1050 like an 8" drive.

Many of my binary files would not run under any of the four versions of SpartaDos. This did not seem to be due to errors in the file conversion utility, as I was able to reconvert the files to DOS 2 and run them. I did not have any trouble running basic programs under SpartaDos. There must be some memory conflicts with this DOS and some machine language programs.

Another small complaint: The disk directory lists the individual file lengths in bytes, and free disk space in sectors. So keep your calculator handy.

SpartaDos cannot be used with the Axlon Ramdisk. This DOS attempts to find something in the drive hardware which is not present in the Ramdisk and gives an error message.

You really have to commit yourself to this DOS because you must go through lengthy file conversions to use it. If you're at all like me, with hundreds of disks in DOS 2 compatible format lying around, you will probably find the time required to convert over to this DOS prohibitive.

SpartaDos is a very fine product, but its appeal is limited to a relatively small number of Atari owners with

continued on next page



very specialized requirements. Consider this product carefully before you buy.

### MYDOS 3.08A

MYDOS, by Wordmark Systems, is the DOS shipped with the ATR8000. It is a menu driven DOS which supports all documented Atari DOS 2 functions and is compatible with all Atari drives and DOS 2 type files. The menu is nearly identical to DOS 2 with a couple of additions: There is a status line above the menu informing the user of online drives and their densities and default drive number, and two different options, O and P.

MYDOS option O is used to specify drive type, number of buffers, and write verify on/off. If you have a configurable drive, you can specify formatting for 5 1/4" and 8" drives with options similar to SpartaDos. MYDOS allows 35, 40, 77 and 80 track formats for single or double sided drives in single or double density.

MYDOS option P allows the user to change drive density and specify the default drive (it need not be drive 1).

MYDOS preserves the best features of both Atari DOS 2 and SpartaDos. No special hardware is required but special drive types are supported. MYDOS files are directly compatible with single density DOS 2 files. MYDOS does not seem to have the same memory conflicts with machine language programs that SpartaDos has.

This is definitely one of the easiest to learn and one of the most potentially useful DOS's available for the Atari.

### TOPDOS 1.4

TOPDOS is one of the most friendly, full-featured and useful DOS's for the Atari. In fact, it's hard to imagine that any one person could think of all the commands and utilities provided by this product. In spite of its apparent complexity, TOPDOS remains easy to use. The newcomer can take to it like DOS 2, while the more experienced can really customize TOPDOS to fit just about any conceivable system configuration and purpose.

TOPDOS is menu driven with command options identical to Atari DOS 2, except they provide considerably more flexibility. The disk directory command A, for example, includes such options as: number of columns to display directory (up to 2 on screen and 6 on a printer), alphabetize disk directory, compress file directory (to overwrite deleted files and minimize search time), list deleted files (which haven't been overwritten) and list current and deleted files (which can also be un-deleted).

**Many people will convert to this product as they are exposed to its many features.**

Some of the other standard commands which are considerably enhanced over DOS 2 are:

1. Copy, with the following options: append, query/no query, merge and update.

2. Delete, with query/no query.

3. Initialize disk in TOPDOS format, Atari format, and nonstandard drive format. TOPDOS format differs from Atari format in that the files do not include file numbers within the individual file sectors. This special format is required to take advantage of a few special features of TOPDOS such as alphabetization and compression of the disk directory, and to handle double sided double density drives. Atari DOS cannot read the TOPDOS format but TOPDOS can read and write Atari DOS formatted disks.

The nonstandard format option allows those users with compatible drives to specify the number of sectors desired, up to 944 per side in single density and up to 1968 in double density (8" drive).

It is also possible to reformat only the VTOC, on a previously formatted disk. This takes approximately 3

seconds instead of the usual 40 seconds.

4. Duplicate Disk, will sense if your destination disk is of the same format as your source disk and will reformat your destination disk, if required.

5. Binary Load, includes the option to load but not run a binary file. It will also report the load addresses present in a binary file.

6. An online help facility for each command.

Besides the commands shared by DOS 2 and TOPDOS, there are some significant additions. Directly from the main menu you can build "command files" similar to the batch processing files of DOS XL. These command files can call other command files, something DOS XL won't allow. There is a mini-monitor which allows the user to examine and modify specific bytes of memory, and a trouble option to translate cryptic error numbers into brief English explanations.

The "Set/Status" command reveals a TOPDOS customizing menu. Just a few of the options include definition of drive density and system drive number, residence on/off (resident TOPDOS uses 9-10K.), bypass cartridge allowing the user to bypass the cartridge on boot-up and directly access the TOPDOS menu, and such bells and whistles as change left margin and redefine command prompt.

The Axlon Ramdisk and the Mosaic 64 board are fully supported with some versatile options. One can use the Ramdisk in single or double density, change the drive number of the Ramdisk, define it as the system drive, and define which 16K banks are active.

A summary of system status can be called by typing [/] [RETURN]. The status summary includes: the number and density of online drives, current system drive number, the current MEMLO and MEMTOP, number of disk buffers, TOPDOS or Atari disk format, MEM.SAV on or off, DOS resident on or off, cartridge bypass on or off and write verify on or off.



Describing all the subtleties would take about 82 pages (the length of the TOPDOS documentation). I have a feeling that many people will convert to this product as they are exposed to its many fine features.

## WHAT TO BUY?

Before you buy any DOS, keep in mind that some kind of DOS is going to come with (or came with) your disk drive, making it essentially free. If you're going to buy an additional DOS, examine your needs and look for a product that fits your purposes. Certain things, like special hardware requirements, narrow the field. And ease of use is important.

One personal opinion (shared by the **Antic** editors): Don't waste your time with Atari DOS 3!

Atari DOS 2.5 will surely be a hit with many users, because its performance (very good) to price (\$0.00) ratio is tough to beat. Just keep in mind that DOS 2.5 won't do everything! There may be a DOS out there more suited to your needs that's

deserving of your hard-earned money.

*Eric Clausen has owned his Atari since January, 1982. He is a member of ABACUS, the San Francisco users group, and he recently received his dentistry degree from the University of the Pacific. Eric plans to continue his medical training toward a PhD in medicine.*

## MANUFACTURERS

### ATARIDOS 2.5

Atari Corp.

1196 Borregas Avenue

Sunnyvale, CA 94088-3427

(408) 745-2000

Send in your DOS 3.0 Master Disk for exchange.

### SMARTDOS

Astra Systems

2500 South Fairview, Unit L

Santa Ana, CA 92704

(714) 549-2141

Packaged with Astra drives.

### SPARTADOS

ICD, Inc.

1220 Rock Street, Suite 310

Rockford, IL 61101-1437

(815) 229-2999

\$39.95 DOS alone, \$69.95 with doubler (add \$4 shipping to either)

### TOPDOS

Eclipse Software

1058-G Marigold Court

Sunnyvale, CA 94086

(408) 246-8325

\$49.95

### MYDOS

Newell Industries

3340 Nottingham Lane

Plano, TX 75074

(214) 423-1781

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S.W.P. Microcomputer Products

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# MINIATURE GOLF

Plus golf course  
"construction set"

by DAVID PLOTKIN

*Play 8 holes of Atari miniature golf on your Atari and then design your own golf course. Two BASIC programs (Golf and Construction Set) run on all Atari computers with 24K cassette or 32K disk. Disk or cassette. You'll also need your trusty joystick as a golf club.*

When you get tired of dodging demented robots, skulking around caves and frying alien creatures, try your aim at miniature golf, a surprisingly holesome (ouch) game for the entire family.

There's no real limit to the number of players—you could even take this game to a party, along with last month's "Beer Party Atari!" The computer will keep track of each golfer's scores and turns to play.

But first, type in Listing 1, check it with TYPO II and SAVE a copy before you RUN it.

Swing your club by moving the joystick. The club appears as a square with a missing corner. Pushing the joystick button starts your shot. The farther the distance between the club and the ball, the harder the ball will be hit. This means you can try some interesting bounce shots.

The important part of the club is the missing corner. The velocity is calculated from the distance between this corner and the ball; the direction

the ball travels is also calculated from the corner.

Holes-in-one are possible on all the holes provided.

When you sink the ball, play moves to the next player, until all players have played all the holes. The game is then over, and a screen display shows everyone's score plus the name of the winner.

To add additional realism to the course, there is a moving barrier, reminiscent of the windmills found on real miniature golf courses!

Sometimes you totally miss the ball. If your opponents are kind-hearted souls, all you need to do is press the

START button—and you can take the shot over again. These extra shots don't even show up on your score.

## GOLF CONSTRUCTION

Eventually you'll want to design your own holes. That's when you can use the Miniature Golf Construction Set (CS), which generates data statements that are appended to the MG program in line 2000. To use CS, type in Listing 2, check it with TYPO II, and SAVE a copy.







Start with graph paper. It's best to design your hole before going to the computer. You're designing a screen for Graphic Mode 7, so you'll need a grid spanning 0–159 horizontal (x coordinate) and 0–79 vertical (y coordinate).

In constructing a hole, you choose from seven types of prefabricated obstacles (see *Figure 1*). These include four types of right triangles—right, left, up and down, named according to the direction that the apex points. The fifth obstacle is a rectangle, the sixth is a diagonal line, and the seventh a moving barrier. In each case, you determine where to put the obstacle and how big it should be.

When you first run CS, it will ask you where you want your output. Either give D:FILENAME (or C: for cassette). The screen will also request the hole number.

You'll then be asked where you want the hole placed, first with the x position coordinate and then the y coordinate. The program will always specify the information and format it wants.

After locating the hole, specify the starting position for the ball, again by entering the x and then the y coordinates.

With these starters completed, you can place the obstacles. The CS program will run through a sequence, offering you a chance to include down triangles, up triangles, squares, and so on. In each case, you are asked how many obstacles (0–15 of each), and are then led through the process of locating each one.

## SAMPLE DESIGN

Let's create a sample hole. When asked for a hole number, type [1] [RETURN]. Look at *Figure 2* for a sample design. Let's say you want your field to have five objects: a down triangle, an up triangle, a rectangle, a diagonal barrier and a moving obstacle.

Start by placing the hole. The CS program will prompt you to enter x, then y. Type [20] [RETURN] [20] [RETURN]. Place the ball at, say, 150,60 by typing [150] [RETURN] [60] [RETURN].

You'll now be asked how many down triangles you want. Enter [1] and a [RETURN]. Specify the position by locating the baseline—because it's a right triangle, the computer will do the rest. Enter the coordinates in the format requested, with a comma between each number and a [RETURN] at the end of the entry. Thus, a small down triangle in the upper right corner of the field would be 141,0,159.

Establishing an up triangle works the same way. Choose [1] up triangle, then enter 40,79,141 [RETURN] to get the large triangle in *Figure 2*.

If you don't want a certain obstacle, enter [0] when asked "How many?". For this sample, we don't want any right or left triangles.

Choose [1] square/rectangle then specify the square's location by naming the two corners: 70,0,120,20.

The barrier starts with a yes/no choice. Choose [1], and then establish the length of the line along which the barrier moves, as well as the speed it moves. Higher numbers are faster. Use 5,40,60 for the placement and 3 for the speed.

The diagonal lines are located by specifying a corner's x and y coordinates, followed by the lower x position. Try 5,50,26.

When you're finished making a fiendishly difficult hole, you'll be presented with the main menu, which has four choices. The first thing you'll want to do is look at the hole you've just constructed.

If the program encounters any er-

rors attempting to draw the screen, it will stop and let you look at the screen to try to figure out what went wrong. The most common error is to place a triangle too close to the screen edge, so that when the computer attempts to draw the missing corner, you get a cursor out of range.

Touching any key returns you to the main menu, where you may wish to use the second selection, Edit. This takes you to a submenu with a list of obstacles to edit. You must re-enter ALL the data for the particular obstacle you are editing. To return to the main menu, choose option 9 from the submenu.

The third choice lets you Save your data. The final choice is to Quit. If you make this choice by accident, however, all is not lost. Just type GOTO 240 and press [RETURN].

## PLAYING NEW HOLES

Now that you've gone through all this  
continued on next page





Figure 1  
OBSTACLES

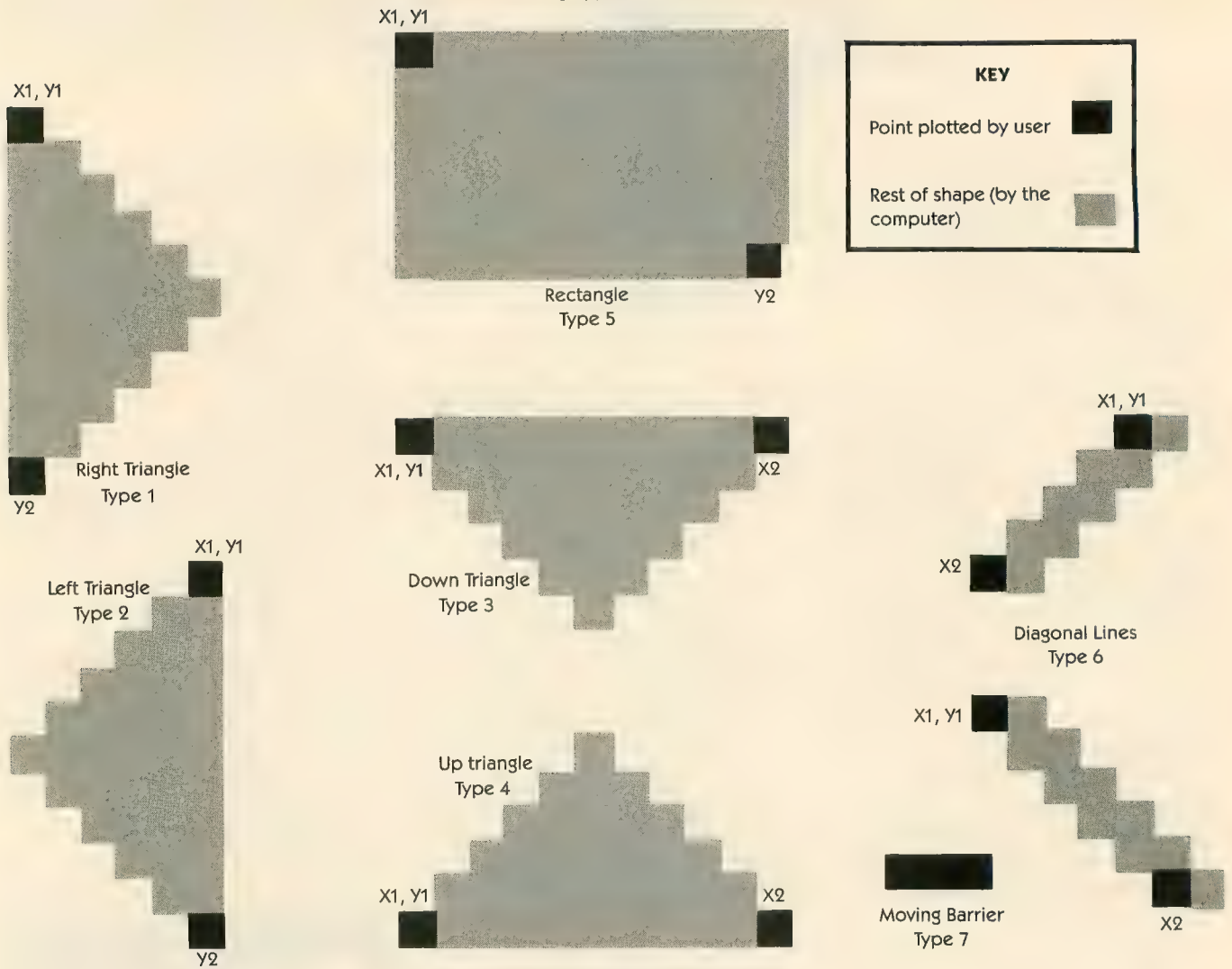
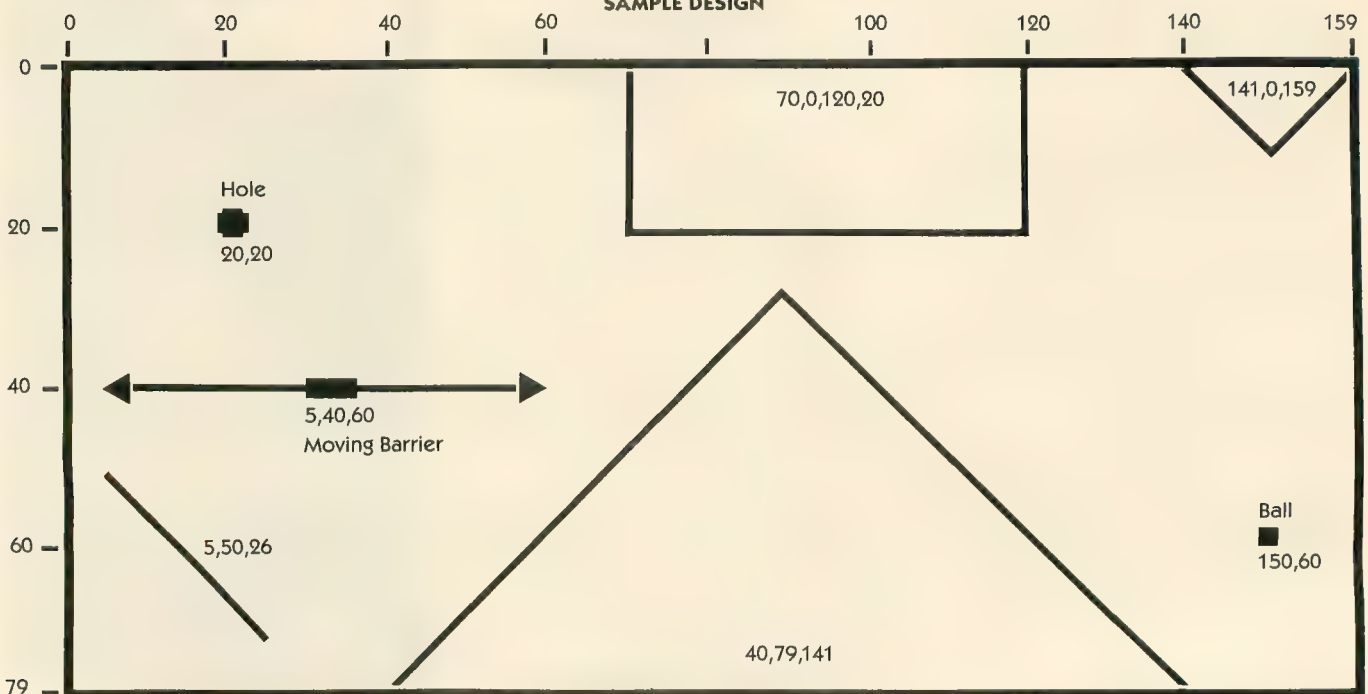


Figure 2  
SAMPLE DESIGN





work to generate the data, how do you use it? First, LOAD or CLOAD Miniature Golf into your computer. Then ENTER "D:FILENAME" or ENTER "C:" the data created using MGCS. For example, if you used D:ROUND for the filename to save your data when using CS, then you would ENTER "D:ROUND". If you are adding more holes, then you will need to adjust the variable MAXHOLE in line 10 of Miniature Golf.

Then SAVE the version with the new hole data, and RUN it. Be warned that if you chose to create a hole number using CS that already exists in your current version of Miniature Golf, your new hole will replace the old one. This change becomes rather permanent if you then write the new version with the same filename as the old one back to the same disk.

## LIST OF VARIABLES

**F1**—flag so that you can't keep pressing the START button and back up your score.

**STARTHOLE, MAXHOLE**—the hole to start on and the final hole.

**PN, NUMPLAY**—the current player number, and the total number of players.

**HOLSCR**—the current hole score.

**HOLENUM**—the current hole number.

**TOTAL**—array which holds each player's score.

**OLDX, OLDY**—the ball's x and y coordinates before your last shot.

**BALLX, BALLY**—ball's x and y coordinates.

**MX, MY**—ball's x and y velocities.

**HX, HY, HSX, HSY**—the magnitude and sign of the ball's x and y velocities.

**BX, BY**—moving barrier's x and y coordinates.

**RITEX, LEFTX, SPEED**—the moving barrier's limits of back-and-forth motion, and the speed of movement.

**CLUBX, CLUBY**—x and y coordinates of the club.

**CLUB\$, BARRIER\$, HOLE, BALL\$, BLANK\$**—arrays to hold the shape data of appropriate items.

**UD1\$, UD2\$, UD3\$**—arrays which hold the data for the machine language routines to move the players (ball, club, barrier).

**NAME\$**—array to hold the names of each player.

## PROGRAM TAKE-APART

**5-15** Set up and call the subroutines to get information.

**20-50** Main Loop. For each hole (line 20), it updates the text window and draws the hole (line 30). Each player moves the club and shoots (line 40). Then erases the hole (line 50).

**60** Jump to Game Over routine.

**700-790** Moves the ball around the field. If a collision is detected with the playfield or the moving barrier then velocities are adjusted. If the ball goes in the hole, calls the subroutine at 850. Note that lines 775-776 do exactly the same thing as the subroutine at line 800 (move the moving barrier), but at a 25% increase in speed, because you don't have to call a subroutine.

**850-880** Sound and graphics for the ball going into the hole.

**900-990** Moves the club when you move your joystick. It reads the joystick (lines 910-920), checks the status of the START button and the flag (line 925), adjusts and redraws the ball and club if the [START] button is pushed the *first* time, and erases and redraws the club (930). If the button is pushed, lines 940-960 calculate the x and y distances between the club

and ball, and "swing" the club. Note that if the club and the ball have the same coordinates, you get a nasty beep.

**1000-1090** Read the data that defines each hole and draws the hole, including the club and ball.

**1100-1130** Draws a type one or two obstacle.

**1200-1230** Draws a type three or four obstacle.

**1300-1330** Draws a type five obstacle.

**1400-1420** Draws a type six obstacle.

**1430-1440** Draws a type seven obstacle.

**1450-1490** Erases the P/M shapes by writing zeros from BLANK\$ into their positions.

**1500-1550** Gets the names of the players. This routine has you input the names into a temporary string, then pads any unused spaces (up to 10) with blanks so that each name is the same length. That way, we can find the name in the larger string NAME\$.

**1600-1735** Sets up the graphics, memory and P/M space and enables P/M graphics. It also reads the shape data into the arrays, and reads the machine language routine data into their arrays.

**1750-1770** Updates the text window.

**2000-2141** Data for the holes.

**3000-3050** The introductory screen.

**3100-3320** The Game Over sequence.

*David Plotkin, a regular contributor to Antic, has recently been noted for his ACTION! games in these pages. He is a chemical engineer by profession.*

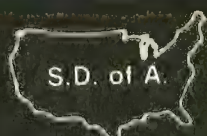
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## SLIDE

continued from page 33

it is also important for a program to function quickly. The program needs to take as few moves as possible to win. One idea here is to always prune the tree of possible moves that are identical to the previous move—the program shouldn't spend its time retracing its steps.

The hardest part of intelligent game design here is to produce a reasonable quiescence function, the subroutine that prunes branches that don't seem fruitful.

Your function will be measured by the number of spurious nodes that are expanded to a solution en route—the perfect function will always prune all spurious nodes. The worst function will expand each node at one level in the tree before looking to the next level—this is called an exhaustive search, and wastes computer time and memory.

If the design of "artificial intelligence" intrigues you, why not see if you can use this puzzle program as a starting point for your own program which solves the 24 Puzzle? Antic would be interested in publishing the shortest and most elegant solution sent in by a reader.

*Mark Moore is from Weatherford, Oklahoma and this is his first publication in Antic.*

Listing on page 56.





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**Antic** type-in listing section includes every full-length program from this issue. Listings are easier to type and proofread, easy to remove and save in a binder if you wish.

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# TYPING SPECIAL ATARI CHARACTERS

**Antic** printed program listings leave a small space between each Atari Special Character for easier reading. Immediately below you will see the way **Antic** prints all the standard Atari letters and numbers, in upper and lower case, in normal and inverse video.

```

ABCDEF GHI JKLMNOPQRSTU VWXYZ
a b c d e f g h i j k l m n o p q r s t u v w x y z
0 1 2 3 4 5 6 7 8 9

```

The Atari Special Characters and the keys you must type in order to get them are shown in the two boxes below. (Squares are drawn around the normal video characters so you can see their positions more accurately, these squares will not appear in listings.)

NORMAL VIDEO			
FOR THIS	TYPE THIS	FOR THIS	TYPE THIS
	CTRL ,		CTRL T
	CTRL A		CTRL U
	CTRL B		CTRL V
	CTRL C		CTRL W
	CTRL D		CTRL X
	CTRL E		CTRL Y
	CTRL F		CTRL Z
	CTRL G		ESC ESC
	CTRL H		ESC CTRL -
	CTRL I		ESC CTRL =
	CTRL J		ESC CTRL +
	CTRL K		ESC CTRL *
	CTRL L		CTRL .
	CTRL M		CTRL ;
	CTRL N		SHIFT =
	CTRL O		ESC
	CTRL P		SHIFT
	CTRL Q		CLEAR
	CTRL R		ESC DELETE
	CTRL S		ESC TAB

INVERSE VIDEO			
FOR THIS	TYPE THIS	FOR THIS	TYPE THIS
	CTRL ,		CTRL Y
	CTRL A		CTRL Z
	CTRL B		ESC
	CTRL C		SHIFT
	CTRL D		DELETE
	CTRL E		ESC
	CTRL F		SHIFT
	CTRL G		INSERT
	CTRL H		ESC
	CTRL I		CTRL
	CTRL J		TAB
	CTRL K		ESC
	CTRL L		SHIFT
	CTRL M		TAB
	CTRL N		CTRL .
	CTRL O		CTRL ;
	CTRL P		SHIFT =
	CTRL Q		ESC CTRL 2
	CTRL R		ESC
	CTRL S		CTRL
	CTRL T		DELETE
	CTRL U		ESC
	CTRL V		CTRL
	CTRL W		INSERT
	CTRL X		

Whenever the CONTROL key (CTRL on the 400/800) or SHIFT key is used, *hold it down* while you press the next key. Whenever the ESC key is pressed, *release* it before you type the next key.

Turn on inverse video by pressing the Reverse Video Mode Key . Turn it off by pressing it a second time. (On the 400/800, use the Atari Logo Key instead.) Note: In the printed listings, inverse characters will be slightly smaller than the normal ones.

Among the most common program typing mistakes are switching certain capital letters with their lower-case counterparts—you need to look especially carefully at P, X, O and 0 (zero).

Some of Atari Special Characters are not easy to tell apart from standard alpha-numeric characters. Usually the Special Characters will be *thicker* than the alpha-nums. Compare the two sets of characters below:

## SPECIAL

```

/  \  CTRL F
\  /  CTRL G
-   =  CTRL N
-   =  CTRL R
+   +  CTRL S

```

## STANDARD

```

/  \  /
\  /  SHIFT +
-   =  SHIFT -
-   =  -
+   +  +

```



# HOW TO USE TYPO II

Type in TYPO II and SAVE a copy to disk or cassette.

Type GOTO 32000 and follow TYPO II onscreen instructions. If the resulting two-letter line codes are not exactly the same as those in the magazine, you mistyped something in that line.

To call back any line previously typed, type an asterisk [\*] followed (without in-between spaces) by the line number, then press [RETURN]. When the complete line appears at the top of the screen, press [RETURN] again. This is also the way you use TYPO II to proofread itself.

To LIST your program, press [BREAK] and type LIST. To return to TYPO II, type GOTO 32000.

To remove TYPO II from your program, type LIST "D:FILENAME",0,31999 [RETURN] (Cassette owners LIST "C:"). Type NEW, then ENTER "D:FILENAME" [RETURN] (Cassette—ENTER "C:"). Your program is now in memory without TYPO II and you can SAVE or LIST it to disk or cassette.

Owners of the BASIC XL cartridge from O.S.S. type SET 5,0 and SET 12,0 before using TYPO II.

Don't type the  
TYPO II Codes!

```
WB 32000 REM TYPO II BY ANDY BARTON
UM 32010 REM VER. 1.0 FOR ANTIC MAGAZINE
HS 32020 CLR :DIM LINE$(120):CLOSE #2:CLO
SE #3
BN 32030 OPEN #2,4,0,"E":OPEN #3,5,0,"E"
YC 32040 ? "K":POSITION 11,1:? "TYPO II"
EM 32050 TRAP 32040:POSITION 2,3:? "Type
in a program line"
HS 32060 POSITION 1,4:? " ":INPUT #2;LINE
$:IF LINE$="" THEN POSITION 2,4:LIST B
:GOTO 32060
XH 32070 IF LINE$(1,1)="*" THEN B=VAL(LIN
E$(2,LEN(LINE$))):POSITION 2,4:LIST B:
GOTO 32060
TH 32080 POSITION 2,10:? "CONT"
MF 32090 B=VAL(LINE$):POSITION 1,3:? " ":
NY 32100 POKE 842,13:STOP
CN 32110 POKE 842,12
```

Don't type the  
TYPO II Codes!

```
ET 32120 ? "K":POSITION 11,1:? "TYPO II"
":POSITION 2,15:LIST B
CE 32130 C=0:ANS=C
QR 32140 POSITION 2,16:INPUT #3;LINE$:IF
LINE$="" THEN ? "LINE ";B;" DELETED":G
OTO 32050
VV 32150 FOR D=1 TO LEN(LINE$):C=C+1:ANS=
ANS+(C*ASC(LINE$(D,D))):NEXT D
WJ 32160 CODE=INT(ANS/676)
JW 32170 CODE=ANS-(CODE*676)
EH 32180 HCODE=INT(CODE/26)
BH 32190 LCODE=CODE-(HCODE*26)+65
HB 32200 HCODE=HCODE+65
IE 32210 POSITION 0,16:? CHR$(HCODE);CHRS
(LCODE)
VG 32220 POSITION 2,13:? "If CODE does no
t match press RETURN and edit line a
bove.":GOTO 32050
```

## ERROR FILE

### KWIK DUMP

March 1985

The last number in line 1070 should be 27 instead of zero.

### WIDE TEXT

January 1985

Substitute the following lines to print wide Z's.

In assembly:

```
0600      CPY #27*
8      ;8 BYTES TO A
LETTER
```

In BASIC:

```
CT 20130 DATA 216
,208,213,185,0,22
4
```

### S.A.M. SOURCE CODE

February 1985

In line 900 of the source code, LDY #01 should be changed to LDY #01.

### KOOKY'S QUEST

February '85

The following line is missing:

```
2100 FOR S=32 TO 16 STEP
-4: SOUND 0,S,14,10: EA=EA
*EA*EA: SOUND 0,0,0,0: EA=1
^0:NEXT S
```

### BUS OVERLINES

Some signals and address labels were printed without overlines in Part III of Earl Rice's Parallel Bus Revealed" (Antic, March 1985).

These are the correct labels:

```
D8XX-DFXX
CS (CHIP RESET)
R/W
D1XX
RDE (READ DATA ENABLE)
DS (DATA STROBE)
DRST (DEVICE RESET)
```

### ADVENT X-5

November '84

Missing line: 8020 RUN. Also, cassette owners should change the 138 in line 4005 to 130. The TYPO II code for line 1005 is EJ.

### ADVENTURE ISLAND

November '84

Line 837 is missing its last item of data, a 4. Also, it will not run with DOS XL.



# TYPO II UPDATE

Since **Antic** began using the improved TYPO II proofreading program in January 1985, we have been getting letters asking for TYPO II codes to some of the most popular pre-1985 programs.

Below you'll find the line-by-line codes—just the codes—for “Biffdrop” (December, 1984), “Escape from Epsilon” (April, 1984), “Advent X-5” (November, 1984) and “Adventure Island” (November, 1984). We'll print additional TYPO II updates if we get enough requests. Enjoy.

## ESCAPE FROM EPSILON

NG 10	FF 200	SK 455	MG 506	FS 545	UC 705	MB 3002	LD 4030
BL 20	JZ 202	VC 460	LN 507	HH 546	CV 710	HS 3003	KS 4034
RH 30	ZK 204	VV 465	KH 611	GG 650	HK 715	CP 3004	IQ 4041
ND 40	WB 210	MW 470	RK 612	DC 651	DC 720	IA 3005	OV 4050
AK 100	JL 212	US 500	ID 613	PN 652	UF 725	CK 3006	LU 4057
OO 105	ZM 214	CZ 505	MO 615	LK 655	DJ 730	MR 3009	MM 4063
UO 110	WM 220	MF 510	RA 616	HS 656	WP 800	CG 3011	NO 4071
ZY 115	ZI 222	JO 550	CO 617	TV 657	ZT 805	MI 3016	CE 4080
CV 120	CI 300	PK 555	JJ 620	TI 658	JH 810	DS 3039	CW 5000
VY 125	LG 305	DT 560	BA 621	CS 659	LH 850	IA 3042	TS 5050
LK 130	AD 310	SV 565	AD 622	WE 660	UM 900	DM 3056	RD 5100
RI 135	UI 325	YE 570	UB 630	TT 661	JO 905	GM 3060	NO 5103
NG 140	KH 330	OK 575	PO 631	EF 662	GI 910	IZ 3076	OK 5107
DR 145	OR 335	ZI 580	LL 632	LA 663	DT 915	CI 4007	JF 5150
NK 150	JM 350	YU 585	GN 633	KE 664	WK 920	JI 4008	DL 5163
YJ 155	CK 355	UP 600	BU 635	DG 690	RL 925	HT 4009	CO 6001
KB 160	LU 360	IP 601	PP 636	UA 691	ES 930	IV 4012	ZK 6002
YO 165	DJ 375	RY 602	OO 637	GD 692	NO 2000	JA 4014	JF 6003
YA 170	HG 380	JJ 603	HZ 640	MV 693	OE 2005	IY 4015	BV 6004
ZU 175	IM 400	PA 604	OG 641	WS 694	ZE 2010	JU 4022	IU 6005
MV 100	PH 450	WZ 605	DY 642	YI 700	RY 2015	MC 4025	

## ADVENT X-5

XC 1	CV 100	XW 300	UK 555	VY 905	IT 9011	SS 9504	FY 9536
DY 2	TZ 105	SC 301	QM 500	SB 1000	MM 9012	DD 9505	AC 9537
OK 3	CV 190	WF 302	MU 605	EJ 1005	LW 9013	ZK 9506	GR 9538
WH 5	DY 200	PB 303	RH 649	HK 1010	NP 9014	PE 9507	II 9539
CE 10	YN 205	KJ 304	EB 650	VD 1015	KK 9015	UH 9508	VV 9540
ZJ 15	LH 210	HH 390	ZU 700	GN 1020	F5 9016	PE 9509	IA 9541
LP 20	YT 215	TH 392	TF 705	JE 1025	VI 9017	DP 9510	DL 9542
UD 25	HZ 220	UF 393	KE 710	SC 1030	ZV 9018	TH 9511	CK 9543
PN 30	CP 225	RO 399	PH 715	CP 1035	HV 9019	FH 9512	DB 9544
BR 50	KP 230	TZ 400	ZH 720	PO 1100	RN 9020	BM 9513	DF 9545
MO 55	DH 240	LY 405	LU 725	HJ 1105	HY 9021	GK 9514	DJ 9546
ZW 60	CW 250	FG 410	ES 730	HD 2000	RL 9022	SC 9515	GZ 9547
CO 100	SO 255	YV 415	ZX 750	B5 2005	GM 9023	IL 9516	HO 9548
CV 105	HF 260	CO 420	LT 755	HM 3000	JV 9024	MU 9517	HH 9549
ZO 110	UT 265	RU 450	GW 775	JH 3005	IO 9025	BR 9518	GA 9550
OR 112	GL 270	LW 455	HW 780	BB 4000	HE 9026	MH 9519	GE 9551
HM 115	DO 275	LU 460	CJ 785	IK 4005	KK 9027	GA 9520	GI 9552
FL 117	UT 280	YJ 500	ZJ 800	WF 4010	TU 9028	SV 9521	VM 9553
HN 120	AO 285	JL 502	AM 805	BB 5000	IM 9029	HL 9522	UU 9554
HK 125	LB 290	YS 505	RR 810	KB 8000	MJ 9030	IS 9523	VU 9555
NT 126	HK 300	AW 507	YT 815	SC 8010	GO 9031	WG 9524	VY 9556
LC 130	XK 301	WS 510	QQ 820	MZ 8020	JJ 9032	IK 9525	MC 9557
GB 145	HU 350	JL 517	YF 825	PZ 9001	JO 9033	VJ 9526	MG 9558
TF 147	GZ 352	WO 522	CE 830	WY 9002	PJ 9034	AO 9527	HO 9559
HN 150	LI 355	OX 525	UZ 835	LM 9003	AN 9035	DY 9528	GH 9560
LL 154	MF 357	UH 526	PF 840	MC 9004	YZ 9036	MV 9529	PL 9561
RT 155	RL 360	NE 527	CJ 845	VK 9005	EJ 9037	ZA 9530	BM 9562
RD 160	WS 365	NR 530	IW 850	LC 9006	MB 9038	HJ 9531	ME 9997
EO 165	JM 367	HA 535	FX 855	AK 9007	WD 9039	YK 9532	ZU 9998
BW 170	WA 370	BZ 545	KL 860	HU 9008	AI 9501	QC 9533	YC 9999
KH 175	PT 375	AS 550	OH 865	IO 9009	SV 9502	PB 9534	VM 10000
			OD 900	TZ 9010	WH 9503	SF 9535	PI 15000



# ADVENTURE ISLAND

00 0	RQ 344	VL 500	FD 670	GU 912	LJ 1211	IL 10720	WS 11318
VK 1	IJ 346	MM 509	XQ 671	RL 913	KK 1212	OH 10721	WN 11319
BH 2	VJ 348	KK 510	VX 672	LU 914	ZK 1213	VI 10808	JB 11320
QN 3	TD 349	LY 511	EC 673	BO 915	RB 1214	FI 10809	TF 11321
QO 4	CS 350	CB 512	WX 674	NO 916	KO 1216	SO 10810	JN 11402
QO 5	MM 352	FW 513	ZZ 675	LO 917	EO 1219	YV 10811	PI 11403
ZL 6	ZS 353	AJ 514	AZ 676	LF 918	CO 1299	CJ 10812	PN 11404
XF 7	XV 360	HG 517	AO 678	CZ 919	VH 1300	IP 10813	RK 11405
TB 8	LL 362	MO 518	NI 680	EK 920	SH 1301	MJ 10814	CK 11406
TS 10	YB 363	VK 519	YM 681	PI 921	MI 1303	MO 10815	BK 11407
QY 12	DP 366	NH 520	HR 682	QL 922	TU 1304	YC 10816	RV 11408
QR 13	RP 367	ZI 521	FI 683	OZ 923	AN 1305	FO 10820	GO 11409
JU 14	CV 369	ME 522	GB 684	TN 924	PY 1610	DG 10821	OM 11410
MI 15	GP 370	ZO 523	QJ 685	PJ 925	CY 1620	AM 10822	RW 11413
LJ 16	KU 371	XG 524	NI 686	PA 926	YW 1635	GB 10908	RJ 11414
UY 17	GL 372	ZU 525	TU 687	AV 927	OB 1639	DV 10909	DZ 11415
TE 18	ET 373	RR 526	QD 688	ZK 928	YY 1640	UC 10910	HN 11416
RT 19	GP 374	OV 530	ZP 689	NU 929	BR 1645	AL 10911	DE 11417
RR 20	BW 375	ZL 532	CD 690	FF 930	LZ 1649	YU 10912	DE 11418
FO 40	UA 376	EX 533	D5 691	PD 931	VJ 1650	ZX 10913	IO 11419
XO 59	NW 377	FO 534	FU 692	PK 932	MO 1660	UZ 10914	CY 11420
RV 64	JC 378	LJ 535	ST 697	PH 933	HM 1661	IL 10915	DT 11421
AE 65	BK 379	MK 536	FC 698	ZP 934	HC 1800	ZB 10916	TO 11502
EW 66	ZU 380	OZ 537	TG 699	AV 935	SF 1810	RY 10920	WJ 11503
SM 90	SB 400	DM 538	WB 750	RQ 936	RJ 1820	XX 10921	AI 11504
PF 91	BI 402	JN 539	UI 751	OS 937	ZA 1835	MC 10922	WA 11505
UV 92	FZ 403	FI 540	KY 752	DY 938	OF 1839	KG 11008	YP 11506
RU 93	JW 404	YB 541	KE 753	DL 939	MM 1840	VF 11009	CL 11507
KP 94	TX 405	VM 542	HP 754	NP 940	BV 1845	LR 11010	RT 11508
FR 95	AZ 406	JZ 543	JB 757	AO 941	MD 1849	NU 11011	ZS 11509
FW 96	ZV 407	RF 544	VJ 759	UF 942	EY 1850	WV 11012	SY 11510
FJ 97	ND 420	FS 545	JK 761	MJ 943	ZY 2000	ZN 11013	JD 11511
FH 98	AA 421	AE 547	YV 762	RN 945	KF 2002	YD 11014	SI 11512
JJ 99	OP 422	LA 560	LK 763	DY 946	HI 2004	MC 11015	QO 11513
NB 100	ZN 423	OF 562	AB 764	RK 947	FK 2006	KL 11016	WU 11514
ZF 101	AP 430	AE 563	DE 801	OE 948	AP 2050	DW 11017	UD 11515
OD 102	KE 431	OH 564	AV 802	EL 949	IB 2100	NC 11018	DV 11516
GV 103	FD 432	MO 565	FP 803	KD 950	SD 2101	LF 11019	HX 11518
YV 104	RG 433	RG 566	WR 804	OP 951	RA 2110	JX 11020	BG 11519
RE 106	VI 434	TA 567	CZ 805	SK 952	LA 2120	MM 11106	MP 11520
AO 108	FP 435	LI 568	OL 806	TI 954	YN 2135	LX 11107	QU 11520
JG 109	CF 436	HV 569	MC 807	XJ 955	H5 2140	5U 11108	LV 11608
GZ 110	YG 437	CK 570	RF 808	MA 956	SO 2141	GO 11109	LD 11609
NK 111	OV 438	RY 571	BZ 809	UF 957	BI 2145	AH 11110	KM 11610
IR 120	RU 439	ND 572	EE 810	GT 958	LQ 2149	JT 11112	HD 11611
YU 121	TE 440	ZY 573	VU 811	MZ 959	DE 2150	HM 11113	LY 11612
YT 122	HA 441	RC 580	BA 812	OR 960	W5 2200	JK 11114	HC 11613
GY 125	DI 442	HF 581	GG 813	DS 961	HD 2210	PJ 11116	JM 11614
DC 126	IC 443	IX 582	AK 814	TG 962	WD 2220	LE 11117	XM 11615
DH 127	NK 444	GD 583	UK 815	UJ 963	YP 2235	SD 11118	RR 11616
AW 130	ZF 445	KH 584	NE 816	CH 964	ZR 2239	NZ 11119	LG 11709
WH 149	SK 446	IF 585	AZ 817	IJ 965	HM 2240	UM 11120	KL 11710
DP 150	SV 447	TM 586	OI 818	EN 966	BK 2245	PJ 11121	GF 11711
HO 151	MM 448	EU 587	IA 819	PY 967	LS 2249	YG 11205	TI 11712
RA 153	BU 449	HL 588	IZ 820	XP 968	XY 2250	KK 11206	MC 11713
VP 154	MK 450	RV 589	SE 821	OH 969	OF 2900	OR 11207	QA 11714
AO 155	NJ 452	CK 590	BZ 822	PH 970	ZS 2904	IX 11208	SZ 11715
XV 199	AL 596	CD 591	UT 823	ND 971	AY 2905	YL 11209	VR 11716
TJ 200	LK 601	VR 592	JV 824	TX 972	TK 2906	UP 11210	RH 11809
OO 201	GU 602	MC 594	VE 825	UH 999	SZ 2907	ZS 11211	OK 11810
AR 205	HA 603	AL 596	MC 826	TI 1000	RZ 2908	IR 11212	DN 11811
HT 206	AD 614	RR 600	HR 827	MF 1001	UN 2909	HT 11213	TY 11812
UU 207	AA 615	GU 602	RJ 828	UN 1002	HR 2911	IO 11214	BS 11813
VK 208	JA 617	AO 614	OE 829	GR 1008	FR 2912	LT 11215	TC 11814
CL 209	SR 620	RA 615	OP 830	AO 1050	YO 2914	BZ 11216	GZ 11815
YD 210	HE 621	JA 617	KX 831	RW 1100	OI 2920	CU 11217	DX 11816
FT 211	MF 624	SR 620	EU 832	FW 1105	VA 2921	VD 11218	DL 11909
LC 213	YV 625	HE 621	HV 833	IX 1106	OO 2924	CT 11219	TV 11910
ED 270	AE 628	RY 475	WB 834	XL 1109	JK 2925	AE 11220	XP 11911
AA 271	NS 838	MF 624	VB 835	NU 1110	OM 2926	GY 11221	DR 11912
IT 272	TR 629	WB 476	ZF 836	LH 1111	EJ 2927	GO 11302	ZL 11913
BO 277	MN 630	YH 477	HF 837	VY 1112	KK 2929	JJ 11303	YL 11914
OV 278	SR 640	GM 478	NS 838	IT 1113	ZH 2930	KE 11304	WF 11915
RL 279	TE 641	WP 479	AE 844	OB 1114	XI 2950	IR 11305	PR 11916
DD 280	MM 660	MO 480	TR 901	UX 1115	DL 2951	RV 11306	AB 12010
YU 281	EX 661	XW 481	NR 902	RO 1118	ZR 3000	NY 11307	GK 12012
NA 283	HX 662	ZW 482	BN 903	VX 1119	ID 10513	ON 11308	BM 12013
AC 285	SJ 663	SW 490	KR 904	EO 1120	TE 10612	ZO 11309	SR 12014
OK 300	HY 664	ZV 491	YH 905	VO 1130	RG 10613	LG 11310	OZ 12015
OC 305	CK 665	UD 500	RO 906	CM 1199	JE 10614	UV 11312	NT 12016
VL 310	CG 666	JO 501	AZ 907	OD 1200	YR 10711	FM 11313	RA 12112
ZO 315	AI 667	TV 502	MC 908	GO 1205	PU 10712	TX 11314	DL 12113
FK 340	TI 910	TK 505	CK 909	KI 1206	CZ 10713	KG 11315	LK 12114
PB 341	HN 1209	EX 506	TI 910	HN 1209	OH 10714	OP 11316	ZE 12115
TM 342	OR 1210	ZW 507	HN 911	OR 1210	EB 10715	KC 11317	NV 12116



# BIFFDROP

BF 1	MK 205	KM 355	KD 530	UM 614	KP 4001	ZM 10003	OZ 10043
DY 2	PJ 210	KA 360	JM 535	TL 615	JE 4002	OB 10009	OX 10049
OK 3	VM 215	OK 365	TT 550	IR 616	SB 4003	TT 10010	RC 10050
HI 5	YG 220	PV 370	CV 555	JF 618	CO 4004	PE 10011	KV 10051
CO 100	OA 225	IL 400	EH 560	KF 620	YA 4005	SO 10012	YK 10059
VH 105	VZ 230	FC 405	YG 565	CE 625	YA 4006	NM 10019	HS 10060
BA 110	UI 231	CB 410	BU 570	ED 675	DF 5050	P5 10020	PR 10061
XR 115	BC 232	LF 415	UP 575	ZB 680	EX 5055	BE 10021	GB 10062
RP 120	FF 233	LF 420	AV 580	SC 700	VQ 5075	HJ 10022	JQ 10063
BF 125	RA 234	HY 425	NT 585	JE 705	XA 5080	LS 10023	CO 10069
NM 130	RS 235	FW 430	MM 590	EA 710	RA 5090	UC 10029	GL 10070
QH 135	ZR 240	RU 435	CY 600	YI 800	EY 5091	HZ 10030	LZ 10071
PH 140	IP 245	KW 500	DF 605	IA 805	JM 6000	WR 10031	HW 10072
GZ 145	KJ 250	CC 505	ER 607	DZ 010	IR 6005	HN 10032	BO 10073
MM 150	NZ 255	MH 510	IS 610	SR 815	MM 9000	AC 10039	DB 10079
MT 155	HO 300	BO 515	ZZ 611	EP 820	DN 10000	EM 10040	MC 19999
GN 160	UR 305	UC 520	BZ 612	OC 980	GL 10001	VY 10041	
BO 200	OV 350	BT 525	PH 613	IV 4000	AB 10002	LV 10042	

## TECH TIPS

### REHABILITATING DISABLED [BREAK] KEY

Include this routine at the beginning of your next Autoboot BASIC program for an elegant method of selectively disabling the [BREAK] key.

When your program is booted normally, it will be safe from overly-curious or clumsy fingers. If you wish to modify the program, boot it while pressing the [SELECT] key and the [BREAK] key will be re-enabled.

### RAMTOP RESET

Next time you alter RAMTOP (location 106) to make room for your own machine language routines, use the line below to make sure RAMTOP is reset to its original value.

```
POKE 106,PEEK(740):GRAPHICS 0
```

Don't type the  
TYPO II Codes!

```
JS 1 BRK=1:IF PEEK(53279)=5 THEN BRK=0
VL 2 GOTO 10
VE 5 IF BRK THEN POKE 16,112:POKE 53774,1
    12:POKE 580,1
TA 10 REM START OF YOUR PROGRAM
LB 20 REM (USE 'GOSUB 5' TO DISABLE [BREA
    K] KEY)
```

the 24 puzzle—can YOU program a solution?

## SLIDE

Article on page 33.

### LISTING 1

Don't type the  
TYPO II Codes!

```
UC 10 REM SLIDE
IE 20 REM BY MARK MOORE
FW 30 REM (c) 1985, ANTIC PUBLISHING
AZ 40 DIM N(30)
OU 50 GRAPHICS 0:SETCOLOR 2,7,0:SETCOLOR
    4,0,2:POKE 752,1
RG 60 POSITION 17,1:? "SLIDE":POSITION 13
    ,2:? "by Mark Moore":POSITION 6,18:? "
    Please Wait!"
HQ 70 POSITION 2,4:POKE 82,12:?
```

```
MK 80 ? " "
AT 90 ? " "
UH 100 ? " "
ZS 110 ? " "
TP 120 ? " "
LF 130 ? " "
CF 140 ? " "
AA 150 ? " "
VZ 160 ? " "
AE 170 ? " "
YOU ARE ON
```



```

OV 180 ? " [=====]"
CS 190 POKE 82,2:?:C=1
TT 200 FOR V=1 TO 5:HL=5:IF V=5 THEN HL=4

MR 210 FOR H=1 TO HL
BE 220 R=INT(RND(8)*24)+1
TW 230 N(C)=R
UO 240 FOR P=0 TO C-1:IF N(P)=R THEN 220
DU 250 NEXT P:C=C+1
BZ 260 POSITION H*2+12,V*2+4:?:CHR$(64+R)

MR 270 NEXT H:NEXT V
ZF 280 ? :? :? :? " Arrange in alphabetic
al order (A-X)."
```

```

TV 290 POSITION 3,7:?: "YOU CAN "
GR 300 ? "MOVE INTO"
OO 310 ? "THE BLANK"
XH 320 ? " SPACE.":?
AA 330 ? " NO "
JO 340 ? "DIAGONAL"
GE 350 ? " MOVES."
```

```

XQ 360 H=22:V=14:POKE 20,0:POKE 19,0:POKE
18,0
IF 370 S=STICK(8)
XY 380 IF PEEK(764)=33 THEN 640
EZ 390 IF S=14 AND V>6 THEN V=V-2
LH 400 IF S=13 AND V<14 THEN V=V+2
KH 410 IF S=7 AND H<22 THEN H=H+2
AZ 420 IF S=11 AND H>14 THEN H=H-2
MP 430 LOCATE H,V,C
PG 440 POSITION H,V:?:CHR$(C+128)
YR 450 IF S=15 THEN FOR D=1 TO 10:NEXT D
SA 460 IF S<>15 THEN FOR D=14 TO 0 STEP -
0.5:SOUND 0,30,10,D:NEXT D:POKE 53279,
0
BS 470 POSITION H,V:?:CHR$(C):POSITION 37
,10:?:CHR$(C)
VM 480 IF STRIG(0)=0 THEN 500
PU 490 GOTO 370
EB 500 LOCATE H,V+2,K
YD 510 IF K=160 THEN POSITION H,V+2:?:CHR
$(C):GOTO 610
```

```

FJ 520 LOCATE H,V-2,K
AR 530 IF K=160 THEN POSITION H,V-2:?:CHR
$(C):GOTO 610
HF 540 LOCATE H+2,V,K
BH 550 IF K=160 THEN POSITION H+2,V:?:CHR
$(C):GOTO 610
IJ 560 LOCATE H-2,V,K
DR 570 IF K=160 THEN POSITION H-2,V:?:CHR
$(C):GOTO 610
NK 580 LOCATE 1,1,K
NR 590 POSITION 12,21:?: " [=====]MOVES [=====]":
SOUND 0,70,12,6:FOR D=1 TO 30:NEXT D
RZ 600 SOUND 0,0,0,0:POSITION 12,21:?: "--
-":GOTO 370
TM 610 POSITION H,V:?: " [=====]"
ZS 620 FOR D=14 TO 0 STEP -1:SOUND 0,20,1
2,D:NEXT D:POKE 77,0
PK 630 GOTO 370
NW 640 T=0:POKE 764,255:FOR V1=1 TO 5:HL=
5:IF V1=5 THEN HL=4
IQ 650 FOR H1=1 TO HL
OG 660 T=T+1:LOCATE H1*2+12,V1*2+4,C
KN 670 POSITION H1*2+12,V1*2+4:?: " [=====]":FOR
D=1 TO 10:NEXT D
PG 680 POSITION H1*2+12,V1*2+4:?:CHR$(C)
TV 690 IF C-64<>T THEN 760
JX 700 NEXT H1:NEXT V1
PD 710 POSITION 4,20:?: " [=====]YOU DID IT!! [=====]":?
"TIME: "
```

```

TL 720 T=PEEK(20)+256*PEEK(19)+256*PEEK(1
8):T=T/60
ZY 730 ? :? " "T:" SECONDS"
AV 740 ? :? :? :?
OG 750 END
PX 760 FOR T=1 TO 5:POSITION 3,21:?: " [=====]SOR
RY [=====]":SOUND 0,70,12,8
QH 770 FOR D=1 TO 10:NEXT D:SOUND 0,0,0,0
:POSITION 3,21:?: " "
TZ 780 FOR D=1 TO 10:NEXT D:NEXT T
NK 790 LOCATE 1,1,K:GOTO 370
```

how many notes do YOU bid?

# GUESS THAT SONG

Article on page 24.

## LISTING 1

Don't type the  
TYPO II Codes! 

```

EI 10 REM GUESS THAT SONG!
DH 20 REM BY KARL E. WIEGERS
FW 30 REM (C) 1985, ANTIC PUBLISHING
ZR 50 DIM PLYR1$(8),PLYR2$(8),NAME$(40),C
ATS(44),DONES(40),PS(11),DS(11),BIDS(2
),BLS(38),WHOS(8),S(2)
DT 60 NAME$=" ":NAME$(40)=NAME$:NAME$(2)=
NAME$:DONES=NAME$:BLS=NAME$(3)
FZ 70 CAT$=" rock          classical theme s
ongs general "
```

```

RI 80 S(1)=0:S(2)=0:LAST=2:OLDBID=11
AH 90 GOSUB 1000:REM GET PLAYER NAMES
NM 110 GOSUB 1500:REM GET CATEGORY
FZ 120 GOSUB 2000:REM DO BIDDING
UC 130 GOSUB 2200:REM PLAY SONG
KR 140 GOSUB 2800:REM JUDGE ANSWER
CM 150 GOSUB 3500:REM SEE IF THERE'S A WI
NNER YET
TH 160 IF A=70 OR A=110 THEN END
CE 170 IF A=89 OR A=121 THEN 60
```

```

SM 180 FOR I=1 TO 40:IF DONES(I,I)="" TH
EN 110
GJ 190 NEXT I
KU 200 GRAPHICS 17:?:#6:"SORRY, OUT OF 50
NG$"
KU 210 ? #6:?:#6:" PRESS ANY KEY TO":?:#
6:" PLAY AGAIN"
QE 220 GOSUB 900:GOTO 60
UP 800 FOR I=1 TO 15:SOUND 0,96,10,10:NEX
T I
VH 810 FOR I=1 TO 15:SOUND 0,128,10,10:NE
XT I
RI 820 SOUND 0,0,0,0:RETURN
XD 900 OPEN #1,4,0,"K:":GET #1,A:CLOSE #1
:RETURN
ZN 1000 GRAPHICS 18:TRAP 1000:POKE 65,0
VW 1010 POSITION 2,0:?:#6:" [=====] that SON
G!"
```

continued on next page



```

JH 1020 POSITION 1,4:? #6:"WHO IS PLAYER
  10"
ZH 1030 POSITION 5,5:? #6:"?":Y=5:GOSUB 1
  100
SB 1040 PLYR15=NAME$(1,I-1)
NT 1050 POSITION 1,8:? #6:"WHO IS PLAYER
  20"
GW 1060 POSITION 5,9:? #6:"?":Y=9:GOSUB 1
  100
SU 1070 PLYR25=NAME$(1,I-1)
UV 1080 TRAP 40000:RETURN
EP 1100 OPEN #1,4,0,"K:"
GR 1110 FOR I=1 TO 14:GET #1,A
NG 1120 IF A=155 THEN 1150
WP 1130 POSITION I+5,Y:PUT #6,A
HK 1140 NAME$(I,I)=CHR$(A):NEXT I
DS 1150 CLOSE #1:RETURN
HD 1500 GRAPHICS 0:POKE 752,1:POKE 700,80
  :POKE 710,10
UM 1510 DL=PEEK(560)+256*PEEK(561)
BB 1520 POKE DL+3,70:FOR I=6 TO 10:POKE D
  L+I,6:NEXT I
WP 1530 POSITION 1,0:? #6:PLYR15:POSITION
  11,0:? #6:PLYR25
YU 1540 POSITION 3,1:? #6:5(1):POSITION 1
  3,1:? #6:5(2)
MM 1550 SONG=INT(100*RND(0)):IF SONG<1 OR
  SONG>40 THEN 1550
YA 1560 IF DONE$(SONG,SONG)="1" THEN 1550
XQ 1570 CA=INT((SONG+9)/10):LN=3990+SONG*
  10
BG 1580 POSITION 20,2:? #6:"CATEGORY:":CA
  TS(11*CA-10,11*CA)
BK 1590 RETURN
JB 2000 OLDBID=11
KZ 2005 TRAP 40000:IF LAST=1 THEN WHOS=PL
  YR25
QG 2010 IF LAST=2 THEN WHOS=PLYR15
QM 2020 POSITION 2,6:? WHOS:", you can gu
  ess that song in":? "how many notes...
  "
YQ 2030 POSITION 20,7:INPUT BIDS
UV 2035 IF BIDS="0" THEN OB=2:GOTO 2071
GI 2036 IF BIDS<"1" THEN 2040
TA 2037 IF LAST=2 THEN LAST=1:GOTO 2030
SN 2038 IF LAST=1 THEN LAST=2
AL 2039 BIDS="P":OLDBID=1:POSITION 10,4:?
  "CURRENT BID = ":OLDBID:" "
EJ 2040 IF BIDS="P" OR BIDS="P" THEN 2110
KL 2050 TRAP 2070:NUBID=VAL(BIDS)
FH 2060 IF NUBID<OLDBID AND NUBID>0 THEN
  2070
JF 2070 OB=OLDBID
OB 2071 GOSUB 800:? :? "MUST BE FROM 1 TO
  ":OB-1:", OR ☐ TO PASS":FOR TIM=1 TO
  500:NEXT TIM
MK 2075 ? "+Please try again.
  ":FOR TIM=1 TO 500:NEXT TIM
WJ 2077 ? "+
OA 2080 POSITION 20,7:? " ":GOTO 2030
MB 2090 OLDBID=NUBID:LAST=1+(LAST=1):POS
  ITION 10,4:? "CURRENT BID = ":OLDBID:"
  "
QC 2100 POSITION 1,6:? BLS:? BLS:? BLS:?
  BLS:GOTO 2005
HP 2110 IF OLDBID=11 THEN OLDBID=10
AI 2120 RETURN
PI 2200 POSITION 1,6:? BLS:? BLS:? BLS:?
  BLS
PW 2210 IF LAST=1 THEN WHOS=PLYR15
RR 2220 IF LAST=2 THEN WHOS=PLYR25
CE 2230 POSITION 2,6:? "Okay, ":WHOS:", h
  ere are your ":OLDBID:" notes."
GR 2240 ? "For ":11-OLDBID:" point":IF O
  LDBID<10 THEN ? "5":
K5 2245 ? ", ☐
WZ 2250 FOR I=1 TO 300:NEXT I
AF 2260 GOSUB 2500
OU 2270 POSITION 2,10:? "Press ☐ for answ
  er, ☐ to play again"
ZW 2280 GOSUB 900
YM 2290 IF A=82 OR A=114 THEN 2260
LA 2300 IF A<>65 AND A<>97 THEN GOSUB 800
  :GOTO 2200

```

```

AJ 2310 RETURN
NJ 2500 RESTORE LN:READ TEMPO,PAUSE,PS,DS
  ,NAMES
ZE 2510 FOR I=1 TO OLDBID
UW 2520 FOR J=1 TO TEMPO*(ASC(D$(I,I))-64
  )
IK 2530 SOUND 0,ASC(P$(I,I)),10,8:NEXT J
GB 2540 FOR J=1 TO PAUSE:SOUND 0,0,0,0:NE
  XT J
WF 2550 NEXT I:SOUND 0,0,0,0:RETURN
RL 2800 POSITION 2,10:? "The title of thi
  s song is: " ":? :? NAMES
UH 2810 POSITION 2,15:? "Did ":WHOS:" get
  the title correct?"
ZG 2820 GOSUB 900
YH 2830 IF A=78 OR A=110 THEN 2900
PL 2840 IF A<>89 AND A<>121 THEN GOSUB 80
  0:? :? " PRESS ☐ FOR YES OR ☐ FOR NO"
  :GOTO 2820
NX 2850 FOR I=1 TO 11-OLDBID:5(LAST)=5(LA
  ST)+1:POSITION 3+(LAST=2)*10,1:? #6:5(L
  AST):" "
MD 2860 GOSUB 3100:NEXT I
OX 2870 DONE$(SONG,SONG)="1"
YR 2880 POSITION 2,15:? "Here are the fir
  st ten notes... ":OLDBID=10:GOSUB
  2500
PC 2890 GOTO 3000
UW 2900 FOR I=1 TO OLDBID:5(LAST)=5(LAST)
  -1:POSITION 3+(LAST=2)*10,1:? #6:5(LAS
  T):" "
QT 2910 POKE 53279,1:FOR J=1 TO 20:NEXT J
  :NEXT I
BT 3000 POSITION 7,20:? "☐PRESS ANY KEY TO
  ☐CONTINUE"
JY 3010 GOSUB 900:RETURN
DO 3100 FOR J=8 TO 0 STEP -1:SOUND 0,53,1
  0,J:FOR K=1 TO 4:NEXT K:NEXT J:RETURN
AZ 3500 IF 5(1)>=50 THEN WHOS=PLYR15:GOTO
  3530
CI 3510 IF 5(2)>=50 THEN WHOS=PLYR25:GOTO
  3530
KU 3520 A=0:RETURN
KP 3530 GRAPHICS 10
DK 3540 POSITION 3,4:? #6:WHOS:" ☐GOOD!"
MB 3550 FOR I=40 TO 230:POKE 700,I:NEXT I
CS 3560 LN=5000:OLDBID=11:GOSUB 2500
FE 3570 POSITION 4,8:? #6:"PLAY AGAIN?"
VE 3580 GOSUB 900:IF A=78 OR A=89 OR A=11
  0 OR A=121 THEN RETURN
TF 3600 POSITION 4,10:? #6:"PRESS Y OR N"
  :GOTO 3580
RJ 3999 REM SONG DATA
HA 4000 DATA 15,8,11y10 ☐xy0y,AAABBBBABA,"
  Sunshine of Your Love"
WA 4010 DATA 10,4,☐y0000000,BAHABAIBAB,"
  Yellow Submarine"
HT 4020 DATA 16,4,☐0000r10[0,AAHAAAAAB,"
  Yesterday"
DX 4030 DATA 6,5,y1f[f1yVvVf,CCOCCCBBC,"T
  he Age of Aquarius"
VD 4040 DATA 16,3,00000UQU0e,DBACBCABMB,"
  Scarborough Fair"
BG 4050 DATA 13,4,0U+10+U+10,AAAALAAACL,"
  California Dreaming"
XC 4060 DATA 4,6,00000000HON,BFFCHBFFCH,"H
  appy Together"
TK 4070 DATA 25,4,0y+He+ve<0,AAAAAAAAAA,"
  Stairway to Heaven"
DH 4080 DATA 12,6,0Ifrrf1yVf,CCFBABAHAB,"
  Close to You"
VE 4090 DATA 20,5,☐00yVf[QHH,ABBBBACAAA,"
  Ebony and Ivory"
PN 4100 DATA 28,3,0yVf0yVf0yVf,AAAAAAAAAA,"
  Moonlight Sonata"
HI 4110 DATA 21,4,000y11y1f,BBBABAABBB,"
  Pictures at an Exhibition"
SV 4120 DATA 12,4,<e<5<eH<<H,LAABAAAABAA,"
  Ravel's Bolero"
XJ 4130 DATA 20,7,☐00000HUU0,AAAABABABA,"
  The Blue Danube"
PR 4140 DATA 6,5,☐000000000,CCCMCCCLBB,"B
  eethoven's Fifth Symphony"
IJ 4150 DATA 20,3,☐00y00y0yV[0,AAADADABBC,"

```









# DARKSTAR

## LISTING 1



```
PROC TITLE()      ; PRINT TITLE AND
SC=0  ML=0        ; SCROLL THE COLORS
GRAPHICS(2+16)
POSITION(5,2)
  PRINTDE(6,"dArKsTAr")
POSITION(8,4)
  PRINTDE(6,"By")
```



```

POSITION(1,6)
PRINTDE(6," MiChAeL MiTChEIL")
POSITION(0,09)
PRINTDE(6,"PReSS FiRe To BeGiN!")
DO
FOR CTR=1 TO 10
DO
INCCLR=CHGCLR INCCLR1=CHGCLR
DO
S=STRIG(0)
IF S=0 THEN RETURN FI
MSYNC=0
CLR=INCCLR CLR1=INCCLR1
CLR2=INCCLR+10

INCCLR==+1 INCCLR1==+1
UNTIL VCOUNT&128
OD
OD
CHGCLR==+1
OD

PROC BOX() ; DRAWS THE ENEMY
A=RAND(150)+3 B=RAND(74)+3 COLOR=1
PLOT(A,B)
DRAWTO(A+2,B) DRAWTO(A+2,B+2)
DRAWTO(A,B+2) DRAWTO(A,B)
RETURN

PROC MAIN() ; THE MAIN ROUTINE
INT XX=[1],YY=[0],SS,X,Y,Q
BYTE Z,E,E1,A1,B1,D,C=[0]
BYTE A,B
X=50 Y=50

GRAPHICS(7) COLOR=2 ; DRAW BORDER
SNDST()
PLOT(1,1)
DRAWTO(158,1) DRAWTO(158,79)
DRAWTO(1,79) DRAWTO(1,1)
BOX()
; LOOK FOR COLLISION
DO
Z=LOCATE(X,Y)
IF Z=1 THEN ; ENEMY HAS BEEN HIT
FOR E=1 TO 20
DO WAIT(50) SOUND(0,E,08,10)
SETCOLOR(2,E,10)
OD
SNDST() BOX()
SC==+10 SETCOLOR(2,0,0)
FI
IF Z=2 THEN ; YOU HAVE BEEN HIT
FOR D=1 TO 35
DO COLOR=C
SOUND(0,D,8,10) C==+1
SETCOLOR(2,D,C) SETCOLOR(0,C,D)
SETCOLOR(1,A1,B1)
IF C=4 THEN C=1 FI
A1=RAND(153) B1=RAND(78) PLOT(X,Y)
DRAWTO(A1,B1)
OD
ML==+1 SNDST()
IF ML>2 THEN ; CHECK FOR MEN LEFT
ML=0 GRAPHICS(2+16)
POSITION(4,4)
PRINTD(6,"GAME OVER")
POSITION(4,5)
PRINTD(6,"SCORE: ") PRINTBDE(6,SC)
FOR X=0 TO 242 STEP 2
DO
WAIT(500) SOUND(0,X+1,10,10)
SOUND(1,X+2,10,10)
SOUND(2,X+3,10,10)

```

```

SOUND(3,X+4,10,10)
SETCOLOR(0,X,10)
OD
WAIT(32000) ; DELAY
SC=0 TITLE()
FI
MAIN()
FI

Q==+1 SETCOLOR(1,Q,14)
COLOR=2 PLOT(X,Y)
SS=STICK(0) ; READ THE JOYSTICK
IF SS=14 THEN XX=0 YY=-1
ELSEIF SS=13 THEN XX=0 YY=1
ELSEIF SS=11 THEN XX=-1 YY=0
ELSEIF SS=7 THEN XX=1 YY=0
FI
WAIT(350) ; CHANGE WAIT VALUE FOR
; FASTER OR SLOWER SPEEDS
X==+XX Y==+YY
POKE(53279,5) ; KEYBOARD SOUND
OD
RETURN

PROC START()
TITLE()
MAIN()

```

Don't type the  
TYPO II Codes!

## LISTING 2

```

JP 10 REM DARKSTAR, LISTING 2
SU 20 REM BY MICHAEL MITCHELL
FW 30 REM (C) 1985, ANTIC PUBLISHING
AH 40 GRAPHICS 17:SOUND 0,191,10,15:SOUND
2,190,10,15:SH=2:SS=STICK(0)
KP 50 POSITION 5,5:? #6;"DARK STAR":POSIT
ION 2,10:? #6;"by MICHAEL MITCHELL":POSIT
ION 1,16:? #6;"PRESS ENTER to BEGIN"
GA 60 X=X+1:SETCOLOR 0,X,10:SETCOLOR 1,X+
3,10:SETCOLOR 2,X+5,10:SETCOLOR 3,X+7,
10:IF STRIG(0)=0 THEN 80
SY 70 GOTO 50
SS 80 POKE 559,0:POKE 53768,133:FOR S=1 T
O 2500:NEXT S:GRAPHICS 23:POKE 559,0:S
OUND 0,0,0,0:SOUND 2,0,0,0
RN 90 COLOR 3:XX=1:YY=0:X=50:Y=50:PLOT 2,
2:DRAWTO 159,2:DRAWTO 159,79:DRAWTO 2,
79:DRAWTO 2,2:POKE 559,34
XV 100 SETCOLOR 0,10,15:SETCOLOR 2,5,7:SC
=SC+10
QK 110 A=RND(0)*152+3:0=RND(50)*70+5:COLO
R 1:PLOT A,B:DRAWTO A+2,B
MA 120 POKE 77,0:DRAWTO A+2,B+2:DRAWTO A,
B+2:DRAWTO A,B
ID 130 LOCATE X,Y,Z:IF Z=3 THEN 210
DR 140 COLOR 3:PLOT X,Y:POKE 53279,5:SS=S
TICK(0):IF SS=14 THEN XX=0:YY=-1
TX 150 IF Z=1 THEN FOR B=10 TO 1 STEP -1:
SETCOLOR 4,B,8:SOUND 0,10,8,8:NEXT B:X
=X+XX:Y=Y+YY:SETCOLOR 4,0,0:GOTO 100
MN 160 IF SS=13 THEN XX=0:YY=1
MS 170 IF SS=11 THEN XX=-1:YY=0
FC 180 IF SS=7 THEN XX=1:YY=0
EW 190 X=X+XX:Y=Y+YY:GOTO 130
PG 200 REM EXPLOSION SUBROUTINE
DT 210 S=PEEK(560)+256*PEEK(561)+5:L=0:H=
0:FOR LL=70 TO 0 STEP -1.3:L=L+60:IF L
>255 THEN L=L-256:SOUND 0,LL,8,13
LM 220 SOUND 1,LL+5,8,14:SOUND 2,LL+10,8,
12
HB 230 POKE S,L:POKE S+1,H:NEXT LL:SH=SH-
1:IF SH<0 THEN GOSUB 300:GRAPHICS 18:G
OTO 250
GU 240 GOSUB 300:GRAPHICS 7+16:GOTO 90
KL 250 SOUND 0,191,10,15:SOUND 2,190,10,1
5
YY 260 POSITION 5,3:? #6;"GAME OVER":POSI

```

continued on next page



```

MY 290 SH=2:GOTO 260
VT 300 FOR D=0 TO 3:SOUND D,0,0,0:NEXT D:
RETURN

```

# OVERFLOW

Article on page 39.

Don't type the  
TYPO II Codes!

```

9,JW:POKE 53278,0
MH 340 SOUND 0,0,0,0,GOTO 140
SP 350 FOR X=1 TO 10:Q(X)=Q(X)*2:NEXT X:FOR
  X=DL+4 TO DL+31 STEP 3:Y=PEEK(X):PO
  KE X,Y+(Y/2=INT(Y/2)):NEXT X:GOTO 330
D0 360 J=0:POKE 656,3:POKE 657,9?"PRESS
  <START> TO BEGIN":IF SC>HC THEN HC=5
  C
MP 370 YC=YC+(YC<255)-255*(YC=255):POKE 7
  04,YC:IF PEEK(53279)<>6 THEN 370
FY 380 FOR X=DL+4 TO DL+31 STEP 3:POKE X,
  108:NEXT X:POKE 89,EA:POKE 88,PLY:POSIT
  ION 0,0:? #6:AS(1,8):POKE 53251,120
YD 390 POKE 704,19
LT 400 POKE 89,JW:POKE 88,YX:POSITION 0,0
  :? #6;" "":POKE 707,TUNL:
  POKE 53249,0:POKE 53259,1:GOTO 110
TN 410 FOR X=0 TO 511:POKE X+CH,PEEK(X+57
  344):NEXT X:FOR X=8 TO 23:READ A:POKE
  X+CH,A:NEXT X
SX 420 FOR X=DL TO DL+2:POKE X,112:NEXT X
  :FOR X=DL+3 TO DL+30 STEP 3:POKE X,69:
  POKE X+1,108:POKE X+2,5/256:NEXT X
EE 430 POKE DL+33,66:POKE DL+34,PEEK(660)
  :POKE DL+35,PEEK(661):FOR X=DL+36 TO D
  L+38:POKE X,2:NEXT X:POKE DL+39,65
Q0 440 FOR X=RA+32 TO RA+191:POKE X,255:N
  EXT X:FOR X=JW*256 TO RA:POKE X,0:NEXT
  X:FOR X=1 TO 46:AS(X)=" ":NEXT X
HV 450 FOR X=17 TO 30:READ A:AS(X)=CHR$(A
  +32):NEXT X:AS(46,46)=" ":FOR X=1 TO 1
  6:READ A:B5(X)=CHR$(A):NEXT X
UF 460 POKE 623,1:POKE 54279,MEM-16:POKE
  53277,3:POKE 704,198:POKE 705,198:POKE
  707,TUNL:POKE 53259,1
NU 470 FOR X=5 TO 5+108:POKE X,2:POKE X+1
  47,2:NEXT X:FOR X=5+109 TO 5+146:POKE
  X,1:NEXT X:SOUND 1,160,8,2:GOTO 90
KY 480 DATA 84,170,170,170,170,170,69
  ,84,255,255,255,255,255,255,69
XV 490 DATA 14,14,14,4,31,31,14,14,14,14,
  10,10,10,10,33,35,35,255,255,35,33,
  160,128,128,255,255,128,128,160

```

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# STAR VENTURE

Article on page 23.

## LISTING 1

Don't type the  
TYPO II Codes! 

```

KG 10 REM STAR VENTURE
JT 20 REM BY RONALD SAARI
FH 30 REM (C) 1985, ANTIC PUBLISHING
CP 40 POKE 106,PEEK(740)
TZ 50 GOSUB 780
HQ 60 DIM S$(1):S$=""
QT 70 GOSUB 520
XV 80 SH=3:SC=0:SCREEN=0:MA=5:E=15
RS 90 GRAPHICS 0:POKE 756,STARTLIST/256:W
=0:X=3:Y=12:N=9
VZ 100 ST=15:SS=""
UR 110 POKE 710,0:POKE 752,1
PZ 120 ? "000000:"
ZL 130 POSITION 30,0:? "+" ";SH
QR 140 COLOR ASC("Q"):PLOT 2,2:DRAWTO 38,
2:DRAWTO 38,22:DRAWTO 2,22:DRAWTO 2,3
LX 150 POSITION 2,3:? "Q"
WP 160 ON SCREEN GOSUB 940,950,960,970,98
0
UA 170 A=INT(RND(0)*33)+4:B=INT(RND(0)*19
)+3
LO 180 LOCATE A,B,L:IF L<>32 THEN 170
LW 190 POSITION A,B:? " "
ZD 200 W=W+1:IF W=MA THEN 220
OI 210 GOTO 170
HZ 220 W=0
TT 230 A=INT(RND(0)*33)+4:B=INT(RND(0)*19
)+3
HL 240 LOCATE A,B,L:IF L<>32 THEN 230
BZ 250 W=W+1:IF W=10 THEN 270
KO 260 POSITION A,B:? "◆":GOTO 230
FL 270 COLOR ASC("I"):PLOT 38,11:DRAWTO 3
8,13:COLOR 32:PLOT 2,11:DRAWTO 2,13'
AA 280 SOUND 0,100,10,5:SOUND 1,101,10,5
DK 290 FOR T=0 TO 3
BT 300 POSITION T,12:? "+":FOR D=1 TO 30:
NEXT D:POSITION T,12:? " ":NEXT T:SOUN
D 0,0,0,0:SOUND 1,0,0,0
NE 310 COLOR ASC("I"):PLOT 2,11:DRAWTO 2,
13
CJ 320 POSITION 2,13:? "I"
QT 330 POSITION X,Y:? SS
YV 340 IF X=39 THEN SCREEN=SCREEN+1:GOTO
90
ZM 350 POSITION 8,0:? SC
ZD 360 SOUND 0,5,0,1
JN 370 POSITION 20,0:? E;" "
JO 380 IF PEEK(53279)=6 THEN SOUND 0,0,0,
0:GOTO 205
BZ 390 FOR T=1 TO 10:NEXT T:POSITION X,Y:
? " "
GX 400 IF STICK(0)=14 THEN Y=Y-1
ED 410 IF STICK(0)=13 THEN Y=Y+1
YG 420 IF STICK(0)=7 THEN ST=7
XN 430 IF STICK(0)=11 THEN ST=11
RN 440 IF ST=7 THEN X=X+1:SS=""
HI 450 IF ST=11 THEN X=X-1:SS=""
OO 460 LOCATE X,Y,L:POKE 77,0
AO 470 IF L<>32 AND L<>0 AND L<>9 THEN 57
0
CV 480 IF STRIG(0)=0 AND E>0 THEN E=E-1:S
OUND 0,100,10,15:GOTO 500
EB 490 IF L=9 THEN 570
AV 500 IF L=0 THEN GOSUB 610
NM 510 GOTO 330
TI 520 GOSUB 700
PH 530 POSITION 11,19:? "      PRESS START
"
BN 540 POKE 53279,8:SOUND 0,0,0,0
SS 550 IF PEEK(53279)=6 THEN POKE 53279,8
:RETURN
PN 560 GOTO 550
SE 570 POKE 710,52:POSITION X,Y:? "X":FOR
T=5 TO 0 STEP -1:SOUND 0,T+20,0,T:NEX
T T:POKE 710,0
FH 580 POSITION X,Y:? " ":FOR T=15 TO 0 S
TEP -0.4:SOUND 0,T+10,0,T:SOUND 1,T,12
,T/2:NEXT T
OE 590 SH=SH-1:IF SH=0 THEN 640
SJ 600 GOTO 90
JN 610 POSITION X,Y:? SS:FOR T=15 TO 0 ST
EP -1:SOUND 0,121,10,T:SOUND 1,60,10,T
:SOUND 2,243,10,T:NEXT T
OL 620 N=N-1:SC=SC+100:IF N=0 THEN 680
ZI 630 RETURN
GF 640 ? "◆":POSITION 17,9:? "00000000":P
OSITION 17,10:? "Q GAME Q"
AY 650 POSITION 17,11:? "Q OVER Q":POSITI
ON 17,12:? "00000000"
PE 660 POSITION 2,0:? "000000":SC
RY 670 GOSUB 530:GOTO 80
ZU 680 FOR T=15 TO 0 STEP -1:SOUND 0,150,
10,T:NEXT T:FOR T=11 TO 13:POSITION 38
,T:? " ":NEXT T
ZU 690 RETURN
RE 700 GRAPHICS 0:POKE 710,0:POKE 752,1:P
OKE 712,165
ET 710 POSITION 11,6:? "0000000000000000
Q"
NU 720 POSITION 11,7:? "Q
Q"
JF 730 POSITION 11,8:? "Q STAR VENTURE
Q"
PG 740 POSITION 11,9:? "Q
Q"
ZF 750 POSITION 11,10:? "0000000000000000
Q"
DE 760 POSITION 13,13:? "By Ronald Saari"
BY 770 POSITION 7,16:? "(C) 1985, Antic P
ublishing":RETURN
JZ 780 POKE 106,PEEK(106)-5:GRAPHICS 17
LW 790 POKE 755,1
GU 800 STARTLIST=(PEEK(106)+1)*256
JO 810 POKE 752,1
AN 820 GOSUB 700:POSITION 7,19:? "Refueli
ng, Please stand by...":FOR MOVEME=0 T
O 1023
PP 830 POKE 709,PEEK(20):SOUND 0,(INT(-0.
24*MOVEME+255)),8,4
JL 840 POKE STARTLIST+MOVEME,PEEK(57344+M
OVEME):NEXT MOVEME
ZV 850 RESTORE 890
ZJ 860 READ KY:IF KY=-1 THEN RETURN
EJ 870 FOR MOVEME=0 TO 7:READ VALUE:POKE
KY+STARTLIST+MOVEME,VALUE:NEXT MOVEME
RJ 880 GOTO 860
FS 890 DATA 512,0,0,36,24,24,36,0,0
VY 900 DATA 584,24,90,60,255,255,60,90,24
KE 910 DATA 712,63,31,56,254,254,56,31,63
IP 920 DATA 664,252,248,28,127,127,28,248
,252
GK 930 DATA -1
OZ 940 PLOT 20,7:DRAWTO 20,18:RETURN
CB 950 PLOT 12,7:DRAWTO 12,18:PLOT 28,7:D
RAWTO 28,18:RETURN
WA 960 PLOT 12,4:DRAWTO 28,20:PLOT 28,4:D
RAWTO 12,20:RETURN
OB 970 PLOT 18,7:DRAWTO 12,7:DRAWTO 12,18
:DRAWTO 28,18:DRAWTO 28,7:DRAWTO 22,7:
RETURN
ZJ 980 SCREEN=0:E=E+5:IF MA<20 THEN MA=MA
+5
ZX 990 RETURN

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# MINIATURE GOLF

Article on page 46.

## LISTING 1

Don't type the  
TYPO II Codes! 

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VV 1 REM MINIATURE GOLF
MI 2 REM BY DAVID AND MARISA PLOTKIN
FD 3 REM (C) 1985, ANTIC PUBLISHING
KQ 5 GOSUB 3000
RF 10 GRAPHICS 0:GOSUB 1500:HOLSCR=0:PN=1
:MAXHOLE=8:GOSUB 1600:REM GET NAMES AN
D SETUP P/M GRAPHICS
DQ 15 F1=1:STARHOLE=1
TP 20 FOR HOLENUM=STARHOLE TO MAXHOLE
BH 30 GOSUB 1750:GOSUB 1000:REM SHOW STAT
US AND DRAW HOLE
TF 40 IF PN<=NUMPLAY THEN GOSUB 900:GOSUB
700:POKE 77,0:GOTO 40:REM LOOP TIL EV
ERYONE HAS DONE THE HOLE
IH 50 PN=1:GOSUB 1450:PRINT #6:CHR$(125);
:POKE 53278,0:NEXT HOLENUM:REM ERASE P
/M, SCREEN, GO TO NEXT HOLE
GX 60 GOTO 3100:REM GAME OVER!
XJ 700 REM MOVE THE BALL AROUND THE FIELD

QA 705 HOLSCR=HOLSCR+1:TOTAL(PN)=TOTAL(PN
)+1:GOSUB 1765:FL=0:OLDX=BALLX:OLDY=BA
LLY
QS 710 FOR L=1 TO VEL:TESTX=ABS(BALLX+MX-
48):TESTY=ABS(BALLY+MY-15):LOCATE TEST
X,TESTY,Z
OV 715 IF (Z=0 AND PEEK(53260)=0) THEN GO
TO 770
NX 716 SOUND 0,40,8,14:SOUND 0,0,0,0
YG 717 IF Z=0 THEN GOTO 750
MK 720 IF Z=1 THEN MX=-MX:LOCATE ABS(BAL
LX+MX-48),TESTY,Z1:IF Z1<>0 THEN MY=-MY

CQ 730 IF Z=3 THEN MY=-MY:LOCATE TESTX,AB
S(BALLY+MY-15),Z1:IF Z1<>0 THEN MX=-MX
PY 735 HX=ABS(MX):HY=ABS(MY):HSX=SGN(MX):
HSY=SGN(MY):IF Z<>2 THEN GOTO 770
PB 736 HSK=HSX+(HSX=0):HSY=HSY+(HSY=0)
JE 740 MX=HY*HSX:MY=HX*HSY:LOCATE ABS(BAL
LX+MX-48),ABS(BALLY+MY-15),Z1:IF Z1=0
THEN GOTO 770
WT 745 MX=-HY*HSX:MY=-HX*HSY:LOCATE ABS(B
ALLX+MX-48),ABS(BALLY+MY-15),Z1:IF Z1=
0 THEN GOTO 770
QJ 747 MX=-HX*HSX:MY=-HY*HSY:GOTO 770
MR 750 IF PEEK(53260)=4 THEN MY=-MY:REM H
IT THE BARRIER
PM 760 IF PEEK(53260)=8 THEN GOSUB 850:GO
TO 790:REM HIT THE HOLE
NL 770 BALLX=BALLX+MX:BALLY=BALLY+MY
SO 775 D=USR(ADR(UD05),ADR(BALLS),PMB+512
+BALLY,3,BALLX):IF (BX)=RITEX OR BX<=L
EFTX THEN SPEED=-SPEED
DP 776 BX=BX+SPEED:POKE 53250,BX
HL 780 POKE 53278,0:NEXT L:REM CLEAR COLL
ISIONS
ZV 790 RETURN
ME 800 IF (BX)=RITEX OR BX<=LEFTX THEN S
PEED=-SPEED:REM MOVE THE BARRIER
CM 810 BX=BX+SPEED:POKE 53250,BX
ZI 820 RETURN
BY 840 REM BALL GOES IN THE HOLE
OJ 850 FOR WW=0 TO 100 STEP 2:SOUND 0,WW,
10,4:SOUND 1,100-WW,10,4:POKE 712,WW:N
EXT WW
YQ 860 SOUND 0,0,0,0:SOUND 1,0,0,0:POKE 7
12,198
FT 870 PN=PN+1:HOLSCR=0:FL=1:IF PN<=NUMPL
AY THEN GOSUB 1750:GOSUB 1490:GOSUB 10
80:POKE 53278,0
ZU 880 RETURN
ZE 900 REM MOVE THE CLUB UNDER JOYSTICK C
ONTROL

UM 905 CLUBX=BALLX:CLUBY=BALLY
OT 910 P6=PEEK(632):CLUBX=CLUBX+2*(P6>4 A
ND P6<8)*(CLUBX<20)-2*(P6>8 AND P6<12
)*(CLUBX>46)
GB 915 IF PEEK(53260)>=4 THEN BALLY=BALLY
+MY:D=USR(ADR(UD05),ADR(BALLS),PMB+512
+BALLY,3,BALLX):POKE 53278,0
PW 920 CLUBY=CLUBY+2*(P6=5 OR P6=13 OR P6
=9)*(CLUBY<112)-2*(P6=10 OR P6=14 OR P
6=6)*(CLUBY>12)
CY 925 IF FL=1 OR PEEK(53279)<>6 OR HOLSC
R=0 THEN 930
IX 926 FL=1:HOLSCR=HOLSCR-1:TOTAL(PN)=TOT
AL(PN)-1:GOSUB 1765:GOSUB 1480
MG 927 BALLX=OLDX:BALLY=OLDY:D=USR(ADR(UD
05),ADR(BALLS),PMB+512+BALLY,3,BALLX):
CLUBX=BALLX:CLUBY=BALLY
BS 930 D=USR(ADR(UD15),ADR(CLUBS),PMB+639
+CLUBY,9,CLUBX)
MG 931 IF PEEK(53279)=5 THEN GOSUB 3400:R
EM DISPLAY THE SCORES
QS 933 IF PEEK(644)=1 THEN GOSUB 800:GOTO
910
FR 935 IF (BALLY=CLUBY AND BALLX=CLUBX) T
HEN PRINT CHR$(253):GOTO 910
HJ 940 DX=ABS(BALLX-CLUBX):DY=ABS(BALLY-C
LUBY):MX=SGN(BALLX-CLUBX):IF DX<>0 THE
N MY=DY/DX*SGN(BALLY-CLUBY):SS=DX
ON 945 IF DY>DX THEN MX=DX/DY*SGN(BALLX-C
LUBX):MY=SGN(BALLY-CLUBY):SS=DY
DZ 950 FOR LS=1 TO 55:CLUBX=CLUBX+MX:CLUB
Y=CLUBY+MY:SOUND 0,LS,8,2
VZ 960 D=USR(ADR(UD15),ADR(CLUBS),PMB+639
+CLUBY,9,CLUBX):NEXT LS:REM MOVE THE C
LUB
FV 965 M=ABS(DX)+ABS(DY):S=3+(M>15)+(M>20
)+(M>25)+2*(M>30)+2*(M>35)
PR 970 SOUND 0,40,8,14:SOUND 0,0,0,0:VEL=
5*M:REM SET SPEED OF BALL
EF 980 D=USR(ADR(UD15),ADR(BLANKS),PMB+63
9+CLUBY,9,CLUBX):REM ERASE CLUB
ZX 990 RETURN
YH 1000 RESTORE (2000+(HOLENUM-1)*20):REA
D HOLEX,HOLEY,STARTX,STARTY,NUMTARG
CR 1005 COLOR 1:PLOT 0,0:DRAWTO 0,79:PLOT
159,0:DRAWTO 159,79:COLOR 3:PLOT 0,0:
DRAWTO 159,0:PLOT 0,79
QC 1006 DRAWTO 159,79:COLOR 2:PLOT 0,0:PL
OT 0,79:PLOT 159,0:PLOT 159,79:COLOR 1
:PLOT 1,0:DRAWTO 1,79
CU 1010 FOR L2=1 TO NUMTARG:READ TYPE,X,Y
:IF TYPE=1 OR TYPE=2 THEN GOSUB 1100:R
EM DRAW TYPE 1/2-DOWN/UP TRIANGLE
ZC 1020 IF TYPE=3 OR TYPE=4 THEN GOSUB 12
00:REM DRAW TYPE 3/4-RIGHT/LEFT TRIANG
LE
VS 1030 IF TYPE=5 THEN GOSUB 1300:REM DRA
W SQUARE OR RECTANGLE
AI 1040 IF TYPE=6 THEN GOSUB 1400:REM DRA
W BARRIER
PO 1045 IF TYPE=7 THEN GOSUB 1430:REM DRA
W THE DIAGONAL LINES
DN 1050 NEXT L2
GK 1060 HOLEX=HOLEX+48:HOLEY=HOLEY+16:FOR
W=0 TO 3:POKE PMB+896+HOLEY+W,HOLE(W)
:NEXT W:POKE 53251,HOLEX
NG 1070 STARTX=STARTX+48:STARTY=STARTY+15
:CLUBX=STARTX:CLUBY=STARTY
AE 1075 D=USR(ADR(UD15),ADR(CLUBS),PMB+63
9+CLUBY,9,CLUBX)
TJ 1080 BALLX=STARTX:BALLY=STARTY:D=USR(A
DR(UD05),ADR(BALLS),PMB+512+BALLY,3,BA

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LLX)
BA 1090 RETURN
FH 1100 READ X1:XC=(X+X1)/2:I=(TYPE=1)-(TYPE=2)
LT 1110 LP=Y-I:FOR LQ=X TO XC:COLOR 1:LP=LP+I:PLOT LQ,Y:DRAWTO LQ,LP:COLOR 2:PLOT LQ,LP:PLOT LQ,LP+I
AM 1115 NEXT LQ:LP=LP+I
UA 1120 FOR LQ=XC TO X1:COLOR 1:LP=LP-I:PLOT LQ,Y:DRAWTO LQ,LP:COLOR 2:PLOT LQ,LP:PLOT LQ,LP+I:NEXT LQ
VA 1130 COLOR 3:PLOT X+1,Y:DRAWTO X1-1,Y:RETURN
NJ 1200 READ Y1:YC=(Y+Y1)/2:I=(TYPE=4)-(TYPE=3)
XM 1210 LQ=X-I:FOR LP=Y TO YC:COLOR 1:LQ=LQ-I:PLOT X,LP:DRAWTO LQ,LP:COLOR 2:PLOT LQ,LP:PLOT LQ-I,LP
CV 1215 NEXT LP:LQ=LQ-I
WH 1220 FOR LP=YC TO Y1:COLOR 1:LQ=LQ+I:PLOT X,LP:DRAWTO LQ,LP:COLOR 2:PLOT LQ,LP:PLOT LQ+I,LP:NEXT LP
AM 1230 RETURN
QH 1300 READ X1,Y1
VU 1310 COLOR 1:FOR LP=Y TO Y1:PLOT X,LP:DRAWTO X1,LP:NEXT LP:COLOR 3:PLOT X,Y:DRAWTO X1,Y:PLOT X,Y1:DRAWTO X1,Y1
MH 1320 COLOR 2:PLOT X,Y:PLOT X1,Y:PLOT X1,Y1:PLOT X,Y1
AO 1330 RETURN
ZA 1400 READ X1,SPEED:BX=X+48:BY=Y+15:LEFTH=BX:RITEH=X1+48:BX=BX+SPEED
YK 1410 D=USR(ADR(UD25),ADR(BARRIERS),PMB+768+BY,5,BX)
AM 1420 RETURN
UY 1430 READ X1:Y1=Y+ABS(X1-X):COLOR 2:PLOT X,Y:DRAWTO X1,Y1:PLOT X,Y+1:DRAWTO X1,Y1+1
AT 1440 RETURN
BM 1450 REM ERASE P/M GRAPHICS SHAPES
MY 1460 FOR W=0 TO 3:POKE PMB+896+HOLEY+W,0:NEXT W:REM ERASE THE HOLE
YI 1470 D=USR(ADR(UD25),ADR(BLANKS),PMB+768+BY,5,0):REM THEN THE BARRIER
MX 1480 D=USR(ADR(UD15),ADR(BLANKS),PMB+639+CLUBY,9,0):REM NOW THE CLUB
UH 1490 D=USR(ADR(UD05),ADR(BLANKS),PMB+512+BALLY,3,0):RETURN:REM FINALLY THE BALL
SQ 1500 REM GET THE NAMES OF PLAYERS
ZK 1505 POSITION 10,3:? "MINIATURE GOLF";
ZR 1510 POSITION 0,5:? "How many players (max 8)":INPUT NUMPLAY:IF NUMPLAY>8 THEN ? CHR$(125):GOTO 1510
SL 1520 DIM NAMES(NUMPLAY*10),NNS(10),TOTAL(NUMPLAY)
BU 1530 FOR L=1 TO NUMPLAY:PRINT "NAME OF PLAYER #";L;" (MAX 10 LETTERS)":INPUT NNS:R=LEN(NNS)+1
OK 1540 IF R<10 THEN FOR L1=R TO 10:NNS(L1,L1)=" ":NEXT L1
PY 1550 NAMES[(L-1)*10+1,L*10]=NNS:TOTAL(L)=0:NEXT L:RETURN
GL 1600 REM SETUP P/M GRAPHICS
ER 1610 PMBASE=PEEK(106)-24:POKE 88,0:POKE 89,PMBASE:? CHR$(125)
IZ 1620 GRAPHICS 7:PMB=PMBASE*256:POKE 54,279,PMBASE:POKE 53277,3:POKE 559,46:POKE 623,1:POKE 752,1
FX 1630 DIM UD05(44),UD15(44),UD25(44):RESTORE 1640:FOR W=1 TO 44:READ P:UD05(W,W)=CHR$(P):NEXT W
JZ 1640 DATA 104,104,133,215,104,133,214,104,133,217,104,133,216,104,133,218
AT 1650 DATA 104,170,160,0,177,214,145,216,200,208,4,230,215,230,217,202
EK 1660 DATA 208,242,190,218,16,238,104,104,141,0,208,96
EL 1670 UD15=UD05:UD25=UD05:UD15(42,42)=CHR$(1):UD25(42,42)=CHR$(2)
OR 1680 POKE 704,14:POKE 705,24:POKE 706,52:POKE 707,100:POKE 708,200:POKE 709,228:POKE 710,206:POKE 712,190
CX 1690 DIM CLUBS(9),BARRIERS(5),HOLE(4),

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BALLS(3),BLANKS(9):RESTORE 1740
YL 1700 FOR W=1 TO 9:READ P:CLUBS(W,W)=CHR$(P):NEXT W
AS 1710 FOR W=1 TO 5:READ P:BARRIERS(W,W)=CHR$(P):NEXT W
YC 1720 FOR W=0 TO 3:READ P:HOLE(W)=P:NEXT W
JX 1730 FOR W=1 TO 3:READ P:BALLS(W,W)=CHR$(P):NEXT W
DP 1735 FOR W=1 TO 9:BLANKS(W,W)=CHR$(0):NEXT W:RETURN
IG 1740 DATA 0,0,124,252,252,252,252,0,0,0,255,255,255,0,112,248,248,112,0,120,0
HO 1750 POKE 656,0:POKE 657,0:PRINT "PLAYER: ";NAMES[(PN-1)*10+1,PN*10]:POKE 657,22:? "SELECT for scores";
VZ 1760 POKE 656,1:POKE 657,1:PRINT "HOLE NUMBER: ";HOLENUM:POKE 657,22:? "OPTION to return";
JP 1765 POKE 656,2:POKE 657,1
CV 1770 PRINT "HOLE SCORE: ";HOL5CR;" ";POKE 657,21:PRINT "TOTAL SCORE: ";TOTAL(PN);" ";RETURN
AS 2000 DATA 5,7,80,72,6,1,68,1,92,5,1,50,45,78,5,45,22,65,78,5,95,22,115,78,5,115,50,158,78,6,65,22,87,2
DW 2020 DATA 4,7,142,65,2,5,1,35,125,78,7,130,1,158
LA 2040 DATA 78,7,80,66,5,5,1,1,60,78,5,100,1,159,78,7,70,1,61,7,90,1,99,1,66,1,5,94
TY 2060 DATA 10,70,143,66,3,5,41,30,119,78,7,20,1,1,7,140,1,158
QJ 2080 DATA 15,60,143,60,3,5,40,20,44,78,5,80,1,84,60,5,120,20,124,78
WY 2100 DATA 78,20,80,70,10,1,40,1,70,1,90,1,120,2,40,50,70,2,90,50,120
DC 2101 DATA 5,1,1,54,78,5,54,50,78,78,5,106,1,158,78,5,90,50,106,78,6,55,27,97
CI 2102 DATA 2,7,72,30,84
MW 2120 DATA 10,15,128,65,4,5,1,40,80,79,7,100,1,120,7,140,40,158,7,1,22,12
YH 2140 DATA 145,26,40,65,7,2,90,55,130,5,70,34,109,78,5,110,55,158,78,7,130,1,110,5,70,21,110,22
FK 2141 DATA 5,1,1,10,78,7,53,1,20
RG 3000 GRAPHICS 2+16:POKE 708,36
WR 3010 POKE 752,1:POSITION 2,1:? #6:"DAVID AND GOLIATH Plotkin PRESENT":POSITION 1,3
JL 3015 ? #6;"*****";
SE 3020 POSITION 1,4:? #6;"*****";
OF #6:"":POSITION 5,6:? #6;"*****FIRE";
RD 3025 POSITION 1,5:? #6;"*****";
HM 3030 HOLD=PEEK(708):POKE 708,PEEK(710):POKE 710,HOLD
AZ 3040 FOR W=1 TO 10:NEXT W:IF STRIG(0)=0 THEN RETURN
PO 3050 GOTO 3030
PP 3100 REM GAME OVER SEQUENCE
RI 3110 POKE 53277,0:POKE 559,34:GRAPHICS 1+16:POKE 708,52:POSITION 0,0:? #6;"MINIATURE GOLF ":REM TURN OFF P/M
WP 3120 POSITION 0,1:? #6;" SCORE BOARD":POSITION 0,2:? #6:CHR$(138):POSITION 1,2:? #6:CHR$(170);
PE 3125 POSITION 0,23:? #6:CHR$(10):POSITION 1,23:? #6:CHR$(170):FOR W=2 TO 17 STEP 3:POSITION W,2
LV 3130 ? #6:CHR$(10):POSITION W+1,2:? #6:CHR$(138):POSITION W+2,2:? #6:CHR$(170);
AE 3140 POSITION W,23:? #6:CHR$(138):POSITION W+1,23:? #6:CHR$(10):POSITION W+2,23:? #6:CHR$(170):NEXT W
CB 3150 FOR W=3 TO 21 STEP 3:POSITION 19,W:? #6:CHR$(10):POSITION 19,W+1:? #6:CHR$(138);

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continued on next page



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CX 3160 POSITION 19,W+2: ? #6:CHRS(170)::N
EXT W
RD 3170 FOR W=3 TO 21 STEP 3:POSITION 0,W
: ? #6:CHRS(170)::POSITION 0,W+1: ? #6:CH
RS(138):
IH 3180 POSITION 0,W+2: ? #6:CHRS(10)::NEX
T W:FOR PN=1 TO NUMPLAY:POSITION 2,PN+
3
UO 3190 ? #6:NAMES((PN-1)*10+1,PN*10)::PO
SITION 14,PN+3: ? #6:TOTAL(PN)::NEXT PN
:REM PRINT THE NAMES AND SCORES
CS 3200 WIN=1:IF NUMPLAY=1 THEN GOTO 3240
:REM ONLY ONE PLAYER
XE 3210 FOR PN=2 TO NUMPLAY:IF TOTAL(PN)<
TOTAL(PN-1) THEN WIN=PN:REM FIND THE W
INNER (LOW SCORE)
PT 3220 NEXT PN:FOR PN=1 TO NUMPLAY:IF PN
<>WIN THEN IF TOTAL(PN)=TOTAL(WIN) THE
N WIN=0
SD 3230 NEXT PN
RR 3240 POSITION 2,21:IF WIN=0 THEN ? #6:
"NO WINNER--A TIE!":GOTO 3260
AL 3250 ? #6:"ENTER":NAMES((WIN-1)*10+1
,WIN*10):
ZM 3260 POSITION 1,22: ? #6:"PRESS BACK TO
PLAY":
RR 3300 HOLD=PEEK(709):POKE 709,PEEK(710)
:POKE 710,PEEK(711):POKE 711,HOLD
PV 3310 FOR W=1 TO 10:NEXT W:IF STRIG(0)=
0 THEN RUN
PI 3320 GOTO 3300
YY 3400 REM DISPLAY THE SCORES
MZ 3410 ? CHRS(125):FOR LLO=1 TO NUMPLAY
WL 3420 IF LLO/2<>INT(LLO/2) THEN POKE 65
7,0:GOTO 3440
VH 3430 POKE 657,20
WK 3440 POKE 656,INT((LLO-1)/2)
ES 3450 ? NAMES((LLO-1)*10+1,LLO*10):" "
TOTAL(LLO)::NEXT LLO
YS 3460 IF PEEK(53279)<>3 THEN 3460
RV 3470 ? CHRS(125):GOSUB 1750:RETURN

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## LISTING 2

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PA 10 REM MINI GOLF CONSTRUCTION SET
UE 20 REM BY DAVID AND MARISA PLOTKIN
FW 30 REM (C) 1985, ANTIC PUBLISHING
NK 100 GRAPHICS 0:GOSUB 800:REM PRINT THE
TITLE
YN 110 DIM FILES(15),T1(45),T2(45),T3(45)
,T4(45),T5(60),T6(3),T7(45),X(60),Y(2
),XX(60)
AH 120 REM OUTPUT DEVICE
KA 130 ? "WHAT DEVICE AND FILENAME (FOR C
ASSETTE USE C:)":INPUT #16:FILES:T5=
FILES(1,2)
LS 140 IF (T5="C:" OR T5="D:" OR T5="D1"
OR T5="D2") THEN GOTO 160
IP 150 ? "INVALID DEVICE SPECIFIED. PLEAS
E USE C: OR D:FILENAME":GOTO 130
US 160 GOSUB 1000:REM INITIAL QUANTITIES
MT 170 GOSUB 1100:REM TYPE 1 (DOWN TRIANG
LES)
QH 180 GOSUB 1200:REM TYPE 2 (UP TRIANGLE
S)
AX 190 GOSUB 1300:REM TYPE 3 (RIGHT TRIAN
GLES)
BN 200 GOSUB 1400:REM TYPE 4 (LEFT TRIANG
LES)
WF 210 GOSUB 1500:REM TYPE 5 (RECTANGLES)
DC 220 GOSUB 1600:REM TYPE 6 (MOVING BARR
IER)
MA 230 GOSUB 1700:REM TYPE 7 (DIAGONAL LI
NES)
KF 240 TRAP 240:GOSUB 1800:REM PREVIEW, E
DIT OR SAVE MENU
AO 250 ON CHOICE GOTO 2000,2300,2500,799:
REM CHOOSE THE MENU SELECTION
PP 799 END
ZX 800 ? "X":POSITION 4,0: ? "XXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXX": ? :RETURN
XW 850 ? "XXXXXXXXXXXXXXXXXXXX ENTERED. PLEAS

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E TRY AGAIN":RETURN
ZI 1000 GOSUB 800: ? "WHAT HOLE NUMBER:":
INPUT #16:HOLE
TC 1010 ? "WHAT X POSITION FOR HOLE (0-15
9)":INPUT #16:HOLEX
IK 1020 IF (HOLEX<0 OR HOLEX>159) THEN GO
SUB 850:GOTO 1010
IP 1030 ? "WHAT Y POSITION FOR HOLE (0-79
)":INPUT #16:HOLEY
EM 1040 IF (HOLEY<0 OR HOLEY>79) THEN GOS
UB 850:GOTO 1030
TO 1050 ? "WHAT START X POS. FOR BALL (0-
159)":INPUT #16:STARTX
FH 1060 IF (STARTX<0 OR STARTX>159) THEN
GOSUB 850:GOTO 1050
BW 1070 ? "WHAT START Y POS. FOR BALL (0-
79)":INPUT #16:STARTY
XW 1080 IF (STARTY<0 OR STARTY>79) THEN G
OSUB 850:GOTO 1070
BA 1090 RETURN
MF 1100 GOSUB 800: ? "▼ DOWN TRIANGLES PLAC
E HERE ▼"
SN 1110 ? "HOW MANY DOWN TRIANGLES (15 MA
X)":INPUT T1
OO 1120 IF T1>15 THEN GOSUB 850:GOTO 1110
BT 1130 IF T1=0 THEN GOTO 1190
EJ 1140 ? "FORWARD: UPPER LEFT X AND Y, UP
PER RIGHT X"
MK 1150 FOR L=1 TO T1:LL=(L-1)*3
KX 1160 ? "TRIANGLE NUMBER ";L:" POSITION
":
WF 1170 INPUT X,Y,X1:IF (X>159 OR X1>159
OR Y>79 OR X1<X) THEN GOSUB 850:GOTO 1
160
XP 1180 T1(LL)=X:T1(LL+1)=Y:T1(LL+2)=X1:N
EXT L
BC 1190 RETURN
LS 1200 GOSUB 800: ? "▲ UP TRIANGLES PLAC
E HERE ▲"
QL 1210 ? "HOW MANY UP TRIANGLES (15 MAX)
":INPUT T2
OK 1220 IF T2>15 THEN GOSUB 850:GOTO 1210
DE 1230 IF T2=0 THEN GOTO 1290
ZF 1240 ? "FORWARD: LOWER LEFT X AND Y, LO
WER RIGHT X"
NE 1250 FOR L=1 TO T2:LL=(L-1)*3
KZ 1260 ? "TRIANGLE NUMBER ";L:" POSITION
":
ZG 1270 INPUT X,Y,X1:IF (X>159 OR X1>159
OR Y>79 OR X1<X) THEN GOSUB 850:GOTO 1
260
ZP 1280 T2(LL)=X:T2(LL+1)=Y:T2(LL+2)=X1:N
EXT L
BE 1290 RETURN
SB 1300 GOSUB 800: ? "▲ RIGHT TRIANGLES PLAC
E HERE ▲"
WL 1301 ? "▼"
ZF 1310 ? "HOW MANY RIGHT TRIANGLES (15 M
AX)":INPUT T3
SG 1320 IF T3>15 THEN GOSUB 850:GOTO 1310
EP 1330 IF T3=0 THEN GOTO 1390
RA 1340 ? "FORWARD: UPPER LEFT X AND Y, LO
WER LEFT Y"
NY 1350 FOR L=1 TO T3:LL=(L-1)*3
LB 1360 ? "TRIANGLE NUMBER ";L:" POSITION
":
TL 1370 INPUT X,Y,Y1:IF (X>159 OR Y>79 OR
Y1>79 OR Y1<Y) THEN GOSUB 850:GOTO 13
60
CY 1380 T3(LL)=X:T3(LL+1)=Y:T3(LL+2)=Y1:N
EXT L
BG 1390 RETURN
BV 1400 GOSUB 800: ? "▲ LEFT TRIANGLES PLAC
E HERE ▲"
CH 1401 ? "▼"
OO 1410 ? "HOW MANY LEFT TRIANGLES (15 MA
X)":INPUT T4
UC 1420 IF T4>15 THEN GOSUB 850:GOTO 1410
GA 1430 IF T4=0 THEN GOTO 1490
VA 1440 ? "FORWARD: UPPER RIGHT X AND Y, L
OWER RIGHT Y"

```



```

OS 1450 FOR L=1 TO T4:LL=(L-1)*3
LD 1460 ? "TRIANGLE NUMBER ":L:" POSITION
";
WL 1470 INPUT X,Y,Y1:IF (X>159 OR Y>79 OR
Y1>79 OR Y1<Y) THEN GOSUB 850:GOTO 14
60
EY 1480 T4(LL)-X:T4(LL+1)=Y:T4(LL+2)=Y1:N
EXT L
BI 1490 RETURN
PD 1500 GOSUB 800: ? "SQUARE RECTANGLE PER
CENT"
NC 1510 ? "HOW MANY RECTANGLES (15 MAX)":
:INPUT T5
VY 1520 IF T5>15 THEN GOSUB 850:GOTO 1510

HL 1530 IF T5=0 THEN GOTO 1590
XD 1540 ? "FORMAT: UPPER LEFT X AND Y, LO
WER
RIGHT X AND Y"
QP 1550 FOR L=1 TO T5:LL=(L-1)*4
BJ 1560 ? "RECTANGLE NUMBER ":L:" POS.":
T5
1570 INPUT X,Y,X1,Y1:IF (X>159 OR X1>1
59 OR Y>79 OR Y1>79 OR X1<X OR Y1<Y) T
HEN GOSUB 850:GOTO 1560
CB 1580 T5(LL)=X:T5(LL+1)=Y:T5(LL+2)=X1:T
5(LL+3)=Y1:NEXT L
BK 1590 RETURN
LI 1600 GOSUB 800: ? "COORDEBARRIERPLACE
CENT"
TH 1610 ? "HOW MANY BARRIERS (0-NONE 1-FO
R
BARRIER)":INPUT T6
US 1620 IF (T6<>0 AND T6<>1) THEN GOSUB 8
50:GOTO 1610
IW 1630 IF T6=0 THEN GOTO 1690
QB 1640 ? "FORMAT: LEFT X AND Y BOUNDARY,
RIGHT X BOUNDARY"
IU 1650 INPUT BX,BY,BX1:IF (BX>159 OR BX1
>159 OR BY>79 OR BX1<BX) THEN GOSUB 85
0:GOTO 1650
ZJ 1660 ? "WHAT SPLED (3-4 WORKS BEST)":
:INPUT SPEED
ZO 1670 T6(0)=BX:T6(1)=BY:T6(2)=BX1:T6(3)
=SPEED
BM 1690 RETURN
NV 1700 GOSUB 800: ? "DIAGONAL LINE PLACE
CENT"
UT 1710 ? "HOW MANY DIAGONAL LINES (15 MA
X)":INPUT T7
ZO 1720 IF T7>15 THEN GOSUB 850:GOTO 1710
KH 1730 IF T7=0 THEN GOTO 1790
OV 1740 ? "FORMAT: UPPER X AND Y, LOWER X
"
RA 1750 FOR L=1 TO T7:LL=(L-1)*3
MK 1760 ? "DIAGONAL LINE NUMBER ":L:" POS
.":
FJ 1770 INPUT X,Y,X1:IF (X>159 OR X1>159
OR Y>79) THEN GOSUB 850:GOTO 1760
JP 1780 T7(LL)=X:T7(LL+1)=Y:T7(LL+2)=X1:N
EXT L
BO 1790 RETURN
TP 1800 GRAPHICS 0:GOSUB 800: ? "COORDE
CENT":
NB 1810 ? "1. PREVIEW HOLE":? "2. EDIT HO
LE DATA":? "3. SAVE DATA":? "4. QUIT T
HIS PROGRAM":
CD 1820 ? "YOUR CHOICE":INPUT CHOICE:IF
(CHOICE<1 OR CHOICE>4) THEN ? :GOSUB 8
50: ? :GOTO 1810
AY 1830 RETURN
HB 2000 REM PREVIEW THE HOLE (DRAW TARGET
5)
TX 2004 GRAPHICS 7:POKE 752,1:POKE 708,20
0:POKE 709,228:POKE 710,206:POKE 712,1
98:TRAP 3250
RR 2005 COLOR 1:PLOT 0,0:DRAWTO 0,79:PLOT
159,0:DRAWTO 159,79:COLOR 3:PLOT 0,0:
DRAWTO 159,0
KJ 2006 PLOT 0,79:DRAWTO 159,79:COLOR 2:P
LOT 0,0:PLOT 0,79:PLOT 159,0:PLOT 159,
79
UR 2010 IF T1=0 THEN GOTO 2040:REM DRAWT
DOWN TRIANGLES
IW 2020 FOR L=1 TO T1:LL=(L-1)*3:X=T1(LL)
:Y=T1(LL+1):X1=T1(LL+2)
KI 2030 XC=(X+X1)/2:I=1:GOSUB 3000:NEXT L
:REM DRAW TYPE 1

```

```

UM 2040 IF T2=0 THEN GOTO 2070:REM DRAW U
P TRIANGLES
OZ 2050 FOR L=1 TO T2:LL=(L-1)*3:X=T2(LL)
:Y=T2(LL+1):X1=T2(LL+2)
EG 2060 XC=(X+X1)/2:I=-1:GOSUB 3000:NEXT
L:REM DRAW TYPE 2
ZK 2070 IF T3=0 THEN GOTO 2100:REM DRAW R
IGHT TRIANGLES
XB 2080 FOR L=1 TO T3:LL=(L-1)*3:X=T3(LL)
:Y=T3(LL+1):Y1=T3(LL+2)
IY 2090 YC=(Y+Y1)/2:I=-1:GOSUB 3100:NEXT
L:REM DRAW TYPE 3
ZO 2100 IF T4=0 THEN GOTO 2150:REM DRAW L
EFT TRIANGLES
CC 2110 FOR L=1 TO T4:LL=(L-1)*3:X=T4(LL)
:Y=T4(LL+1):Y1=T4(LL+2)
SS 2120 YC=(Y+Y1)/2:I=1:GOSUB 3100:NEXT L
:REM DRAW TYPE 4
DZ 2150 IF T5=0 THEN GOTO 2171:REM DRAW R
ECTANGLES
XE 2160 FOR L=1 TO T5:LL=(L-1)*4:X=T5(LL)
:Y=T5(LL+1):X1=T5(LL+2):Y1=T5(LL+3)
CJ 2170 GOSUB 3200:NEXT L:REM DRAW TYPE 5

KR 2171 IF T7=0 THEN GOTO 2180:REM DRAW D
IAGONAL LINES
SL 2172 FOR L=1 TO T7:LL=(L-1)*3:X=T7(LL)
:Y=T7(LL+1):X1=T7(LL+2)
GS 2173 Y1=Y+ABS(X1-X):COLOR 2:PLOT X,Y:D
RAWTO X1,Y1:PLOT X,Y+1:DRAWTO X1,Y1+1
RB 2174 NEXT L:REM DRAW TYPE 7
WX 2180 COLOR 3:PLOT HOLEX+1,HOLEY:DRAWTO
HOLEX+3,HOLEY:PLOT HOLEX+1,HOLEY+4:DR
AWTO HOLEX+3,HOLEY+4:REM DRAW HOLE
VE 2190 FOR L=HOLEY+1 TO HOLEY+3:PLOT HOL
EX,L:DRAWTO HOLEX+4,L:NEXT L
AB 2195 IF T6=0 THEN GOTO 2220
BD 2200 FOR L=BX TO BX+8 STEP 2:COLOR 2:P
LOT L,BY:DRAWTO L,BY+2:REM DRAW THE BA
RRIER
RZ 2210 COLOR 3:PLOT L+1,BY:DRAWTO L+1,BY
+2:NEXT L
ZU 2220 LOCATE STARTX,STARTY,Z:Z=Z+2:COLO
R 2:PLOT STARTX,STARTY
VB 2230 POKE 764,255: ? "HIT ANY KEY TO RE
TURN TO MENU":
XC 2240 IF PEEK(764)=255 THEN 2240
YK 2250 POKE 764,255:GOTO 240
NV 2300 REM EDIT HOLE DATA
RN 2310 GRAPHICS 0:GOSUB 800: ? "EDIT HOLE
DATA": ? : ?
EL 2320 ? "ENTER WHICH TYPE OF OBJECT TO
EDIT":? "1. DOWN TRIANGLES"
MH 2330 ? "2. UP TRIANGLES":? "3. RIGHT T
RIANGLES":? "4. LEFT TRIANGLES":? "5.
RECTANGLES"
KR 2340 ? "6. MOVING BARRIER":? "7. DIAGO
NAL LINES":? "8. INITIAL DATA (HOLE NU
MBER,HOLE
LOC.,BALL LOC.):"
DG 2350 ? "9. RETURN TO MAIN MENU"
SV 2360 ? : ? "YOUR CHOICE":INPUT AN5:IF
(AN5<1 OR AN5>9) THEN GOSUB 850:GOTO 2
360
CX 2370 IF AN5=9 THEN GOTO 240
YG 2380 ON AN5 GOSUB 1100,1200,1300,1400,
1500,1600,1700,1000
DE 2390 GOTO 2310
OO 2500 REM SAVE DATA TO DISK OR CASSETTE

CX 2510 GRAPHICS 0:GOSUB 800: ? : ? "PLEASE
WAIT. SAVING YOUR DATA..."
HS 2515 ND=(T1+T2+T3+T4+T7)*4+(T5+T6)*5
XS 2520 LINE=(HOLE-1)*20+2000:NUMTARG=T1+
T2+T3+T4+T5+T6+T7:PLUS=0:COUNT=0:CLOSE
#1:OPEN #1,0,FILES:GOSUB 2710
MT 2530 PRINT #1:HOLEX,"":HOLEY,"":STAR
TX,"":STARTY,"":NUMTARG,"":COUNT=5

DZ 2540 IF T1=0 THEN GOTO 2560
DD 2550 TYPE=1:FOR L=1 TO T1:LL=(L-1)*3:X
H(LL)=T1(LL):XH(LL+1)=T1(LL+1):XH(LL+2
)=T1(LL+2):GOSUB 2750:NEXT L
GP 2560 IF T2=0 THEN GOTO 2580
LZ 2570 TYPE=2:FOR L=1 TO T2:LL=(L-1)*3:X
H(LL)=T2(LL):XH(LL+1)=T2(LL+1):XH(LL+2

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continued on next page



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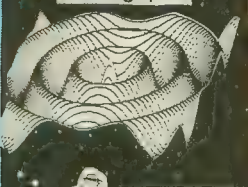
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```

J=T2(LL+2):GOSUB 2750:NEXT L
AE 2580 IF T3=0 THEN GOTO 2600
UV 2590 TYPE=3:FOR L=1 TO T3:LL=(L-1)*3:K
X(LL)=T3(LL):XX(LL+1)=T3(LL+1):XX(LL+2
)=T3(LL+2):GOSUB 2750:NEXT L
BS 2600 IF T4=0 THEN GOTO 2620
CP 2610 TYPE=4:FOR L=1 TO T4:LL=(L-1)*3:K
X(LL)=T4(LL):XX(LL+1)=T4(LL+1):XX(LL+2
)=T4(LL+2):GOSUB 2750:NEXT L
FI 2620 IF T5=0 THEN GOTO 2650
BR 2630 TYPE=5:FOR L=1 TO T5:LL=(L-1)*4:K
X(LL)=T5(LL):XX(LL+1)=T5(LL+1):XX(LL+2
)=T5(LL+2):GOSUB 2750
KD 2640 PRINT #1:T5(LL+3):COUNT=COUNT+1:
ND=ND-1:GOSUB 2765:NEXT L
JB 2650 IF T6=0 THEN GOTO 2680
BX 2660 TYPE=6:LL=0:FOR L=0 TO 2:XX(L)=T6
(L):NEXT L:GOSUB 2750
PN 2670 PRINT #1:T6(3):COUNT=COUNT+1:ND=
ND-1:GOSUB 2765
CT 2680 IF T7=0 THEN GOTO 2700
DJ 2690 TYPE=7:FOR L=1 TO T7:LL=(L-1)*3:K
X(LL)=T7(LL):XX(LL+1)=T7(LL+1):XX(LL+2
)=T7(LL+2):GOSUB 2750:NEXT L
PO 2700 GOTO 240
MM 2710 PRINT #1:LINE+PLUS;" DATA ";;RETU
RN:REM PRINT NEW LINE
YG 2750 PRINT #1:TYPE;"":XX(LL);"":XX(L
L+1);"":XX(LL+2);
CX 2760 COUNT=COUNT+4:ND=ND-4
HK 2765 IF (COUNT<21 AND ND>0) THEN PRINT
#1;"":GOTO 2780
ZE 2770 COUNT=0:PLUS=PLUS+1:PRINT #1;"":I
F ND>0 THEN GOSUB 2710:REM NEW LINE
BM 2780 RETURN
BV 3000 REM DRAW TYPE 1 OR 2
LT 3010 LP=Y-I:FOR LQ=X TO XC:COLOR 1:LP=
LP+I:PLOT LQ,Y:DRAWTO LQ,LP:COLOR 2:PL
OT LQ,LP:PLOT LQ,LP+I
ZV 3020 NEXT LQ:LP=LP+I
UD 3030 FOR LQ=XC TO X1:COLOR 1:LP=LP-I:P
LOT LQ,Y:DRAWTO LQ,LP:COLOR 2:PLOT LQ,
LP:PLOT LQ,LP+I:NEXT LQ
VD 3040 COLOR 3:PLOT X+1,Y:DRAWTO X1-1,Y:
RETURN
FJ 3100 REM DRAW TYPE 3 OR 4
XN 3110 LQ=X+I:FOR LP=Y TO YC:COLOR 1:LQ=
LQ-I:PLOT X,LP:DRAWTO LQ,LP:COLOR 2:PL
OT LQ,LP:PLOT LQ-I,LP
CE 3120 NEXT LP:LQ=LQ-I
HK 3130 FOR LP=YC TO Y1:COLOR 1:LQ=LQ+I:P
LOT X,LP:DRAWTO LQ,LP:COLOR 2:PLOT LQ,
LP:PLOT LQ-I,LP:NEXT LP
AP 3140 RETURN
WF 3200 REM DRAW TYPE 5
VU 3210 COLOR 1:FOR LP=Y TO Y1:PLOT X,LP:
DRAWTO X1,LP:NEXT LP:COLOR 3:PLOT X,Y:
DRAWTO X1,Y:PLOT X,Y1:DRAWTO X1,Y1
MH 3220 COLOR 2:PLOT X,Y:PLOT X1,Y:PLOT X
1,Y1:PLOT X,Y1
ND 3230 RETURN
CN 3250 ? "ERROR TRYING TO DRAW THE HOLE"
:? "PLEASE EDIT AND TRY AGAIN":GOTO 22
30

```

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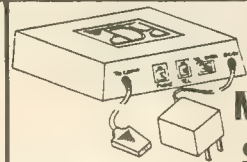
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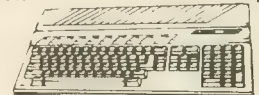
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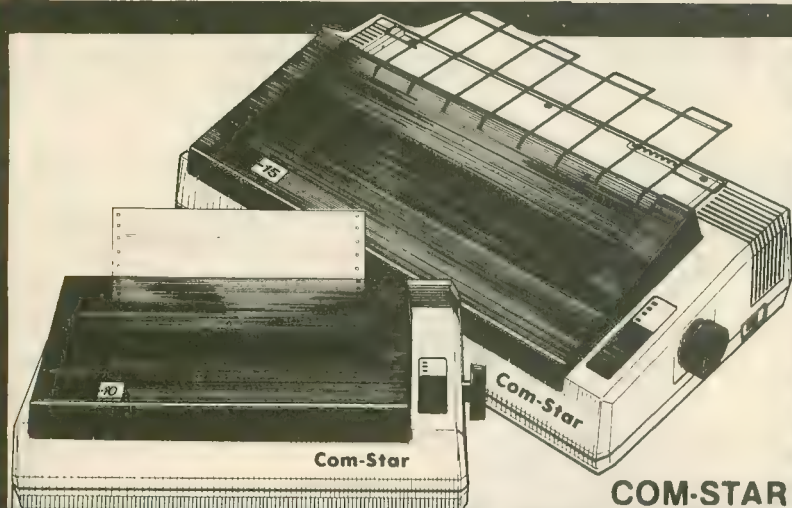
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**• 15 Day Free Trial — 1 Year Immediate Replacement Warranty**

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COM-STAR PLUS+  
Print Example:

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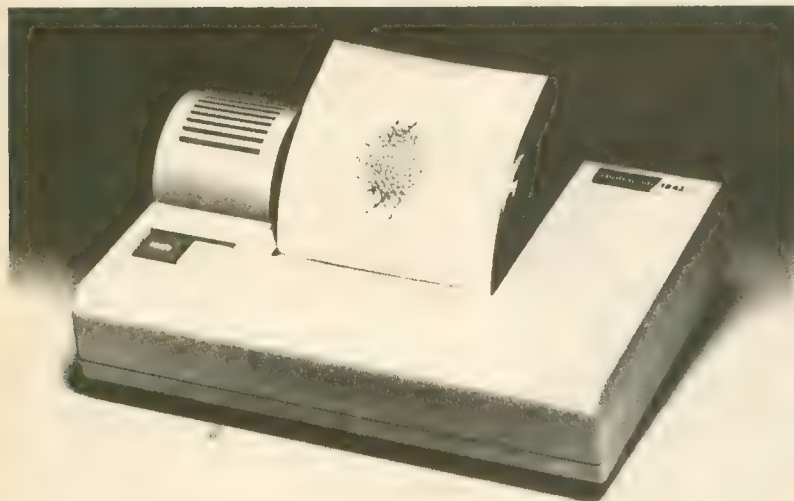


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## \$24<sup>95</sup> SALE!! \$24<sup>95</sup>

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3106	25 Meter Rolls Blue (2 per pkg.)	\$19.95	<b>\$5.95</b>
3107	25 Meter Rolls Black (2 per pkg.)	\$19.95	<b>\$5.95</b>

### 3150 Alphacom 81-100 CPS 80 Column Printer

Now you can have a printer for the cost of a large box of paper. This printer prints in upper and lower case with true lower descenders. Comes with 1 roll of paper and power adapter. With the intelligent interfaces (sold below) you can do Ascii graphics as well as Atari or Commodore graphics. Plus you can do underlining and expanded modes. Print out pictures, program listings, word processing pages, etc. Perfect for the student or homeowner. List \$199.00. **Sale \$39.95.**

80 Column Extra Paper		LIST	SALE
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3155	25 Meter Rolls Blue (2 per pkg.)	\$19.95	<b>\$7.95</b>
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**40 Column Sale \$9.95.**

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**3102 Intelligent Atari Interface** — Allows you to hook the 40 or 80 column printer to the Atari computer, do program listings, allows software screen dumps, etc. Includes Atari graphics and reverse characters. (Specify 40 or 80 Column) List \$59.95.

**40 Column Sale \$9.95.**

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# product reviews

## STAR SG-10

Star Micronics  
200 Park Avenue  
New York, NY 10166  
(212) 986-6770  
\$299.99

*Reviewed by Charles Jackson*

Star Micronics' new **Star SG-10** is a dot-matrix printer to get excited about! Offering both speedy draft quality and great-looking "near letter quality," the SG-10 is a worthy successor to Star's deservedly popular Gemini 10X which had printed out **Antic's** listings for the past six months or so.

In "near letter quality" the SG-10 print head passes over each line twice. During the first pass, the print head runs the top half of a line. Then it returns to the left margin and fills in the bottom half. The "near letter quality" mode can be activated with control codes or by a DIP switch on the side of the printer.

People familiar with Star's Gemini 10X will feel very comfortable with the SG-10. In fact, the SG-10 is essentially a 10X with a slightly different case, "near letter quality" capability and a \$100 lower list price. Nearly all of the 10X and SG-10 printer control codes are identical, both use standard typewriter ribbon, and almost any program written for one machine can be used by the other.

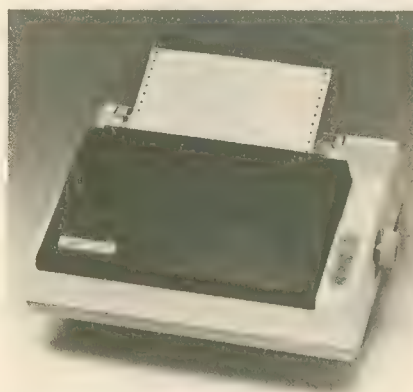
**Antic** has successfully used the SG-10 with AtariWriter, PaperClip, HomePak, Letter Perfect, Print Shop, and every program from our March 1985 Printer Issue, except "Font Maker" (You'll find the fix in this issue's listing section. We had to correct for a 3-byte downloading difference.) We also used the SG-10 "near letter quality" to prepare all the program listings in this issue!

**Antic** bench tests clocked the SG-10 at 91 characters per second, or about 15 percent faster than the Gemini. In "near letter quality," the

SG-10 printed at 22 cps.

The SG-10's 238-page manual is clearer than the Gemini 10X manual was, but it's still not very well organized and lacks an index.

Luckily documentation is not that crucial here. The SG-10 is an extremely versatile, reliable printer that's also simple to install, easy to learn and fun to use.



## COMPUTER AMBUSH

Strategic Simulations Inc.  
883 Stierlin Rd., Bldg. A-200  
Mountain View, CA 94043  
(415) 964-1200  
\$59.95, 48K disk

*Reviewed by Dr. John F. Stanoch*

Four years ago I came upon a full page ad for **Computer Ambush** in a popular wargaming magazine. By the time I finished reading about the game, I was salivating to play it. However, at the bottom of the ad I discovered that **Ambush** was only available for the Apple.

Recently I was happily surprised to see that SSI had released an upgraded and revised edition of **Computer Ambush** for the Atari. In this squad-level game, you are given command of one to ten men in simulating various small unit actions in WWII France.

The non-scrolling multi-screen

map depicts a typical village in the French countryside. One can immediately see that this is an Apple conversion, for the buildings and structures are drawn with white lines on a plain black background with only a tinge of faint color sparsely scattered in certain terrain features.

Only about one third of the length of the mapboard can be shown on the screen at any one time. But the column and row are displayed, which greatly helps in combat movements.

Each character in the game is displayed as either a letter or symbol and is controlled via keyboard commands. These commands consist of a two to six digit code which directs the character to perform a particular kind of action including various types of movements, observation, melee, and weapon/explosive usage. The order summary chart included on the included Squad Cards is an invaluable aid.

Each action takes a specific amount of time to perform. After all the commands by both players are given, the actions are simultaneously executed during the computer resolution phase. Afterwards, a player will sometimes be in store for some very nasty surprises.

There are five solitaire and six two-player scenarios with the computer able to play either the American or German side. To win, the player must attain certain conditions specified in the given scenario. These vary from securing the village from enemy troops to staging a successful ambush. There is also an option allowing the players to generate their own scenarios.

This is a difficult game to learn. It took me nearly two hours to digest the twenty-page manual and understand the commands well enough to play somewhat competently. However, the eleven pages of rules are very clearly written, with numerous examples of play.



# product reviews

Also, an introductory scenario is given with suggested first turn commands for the American (noncomputer) player. New players will find it helpful to study and try to understand these first turn commands before issuing their own.

The last eight pages of the manual are devoted to American and German soldier dossiers. I highly recommend for every player to read these after attempting a game or two. Then the soldiers will no longer be just letters and symbols on the screen, but will become actual *characters* whose lives depend on your decisions.

Although this is a difficult game to learn, the player is rewarded with a wealth of options and decisions after mastering the rules. Because this game simulates man-to-man combat in such detail, it could appeal to both wargamers and role-players.

## MICROSTUFFER

Microbits Peripheral Products  
225 Third Avenue, SW  
Albany, OR 97321  
(503) 967-9075  
\$149.95

*Reviewed by Michael Ciruolo*

With a 64K printer buffer like this MPP product, your printer can produce hardcopies of vast reports or programs while you're working at your computer on something entirely different.

The **Microstuffer** works with any printer, and features a clear button, multiple copy repeat function and a full set of self-diagnostic test procedures. A Centronics parallel connector is standard and a serial RS-232 port is optional.

The crew from MPP thoughtfully included complete pin diagrams for their buffer just in case you ever need to make another cable. There's also an extended self-test feature that checks each chip and connection. The buf-

fer comes with a one year warranty against defects in material and workmanship.

What else can we say? **Antic** is currently using a Microstuffer regularly and it works. It holds a whopping big file in its memory. Frankly, aside from bells and whistles, once you've seen one buffer. . .



## GULF STRIKE

Avalon Hill  
4517 Harford Road.  
Baltimore, MD 21214  
(301) 254-9200  
\$25, 48K disk

*Reviewed by Dr. John F. Stanoch*

One of the hottest flashpoints in the world today is the Persian Gulf. Any conflict occurring here would have a profound effect on the course of history. With this new computer wargame from Avalon Hill, one can explore such a conflict.

In **Gulf Strike** you are faced with directing a combined Iranian/US pro-Western Arab defense against a Soviet and Iraqi invasion.

With a joystick you scroll through a multi-screen high resolution map which depicts most of Iran and all of the Persian Gulf, in 17 different types of terrain. A very nice touch is that

you can stack any number of ground, air and sea units. However, orders can only be given to the top 19 units.

In order to win, the US/Iranian player must prevent the Soviet/Iraqi player from capturing nine out of 21 victory point squares within 25 turns. These squares consist of strategic towns and locations, such as Tehran and Oman Point. The game can be won anytime before the 25th turn. The computer then displays the number of enemy hit points each side has eliminated. In the one-player version, the computer plays the Soviet/Iraqi side.

The 44-page instruction manual is both well-written and complete. Although this is not a very hard game to learn, it is difficult to master. A player must not only place the combat units effectively, but also must be constantly aware of the overall strategic situation.

Experienced wargamers would welcome this complexity as something they can really bite into. A complete 25-turn game can take 15 to 20 hours, even though the box states that playing time is one to five hours. The game save feature is a definite necessity.

As with almost any other game, there are a few problems. There are no zones of control and the Soviet/Iraqi player moves after the US/Iranian player, but before combat takes place. So therefore the invaders can move away from the US allies and avoid combat. Also, during the course of one game a "ghost" US/Iranian unit appeared which was able to move but not attack.

I thoroughly enjoyed playing this game. Because of its complexity, I don't recommend **Gulf Strike** for anyone unfamiliar with wargaming. But to a wargamer, I cannot recommend it highly enough.

continued on next page



# product reviews

## TRIVIA FEVER

Professional Software, Inc.  
P.O. Box 533  
Needham, MA 02194  
(617) 444-5224  
\$39.95, 48K disk

*Reviewed by Michael Ciruolo*

The country's hottest software trivia game is now available for the Atari. **Trivia Fever**, already popular on most leading computers, represents the best in trivia games—as far as trivia goes. As a conversion for the Atari, it's abysmal.

The colors used are Basic Computer Pastels, including several likely to produce upset stomachs in squeamish viewers. The sounds will bring back memories of ballpark music.

Trivia Fever also has the kind of inane computer responses that should have gone out of style ten years ago: "Gee, you must be smarter than you look," and "That was a real tough one." Would you believe, "You must have had your Wheaties this morning?"

But compared to other programs reviewed by **Antic**, Trivia Fever offers the best trivia questions. Choose from serious (not inane) questions in history, sports, films and entertainment, geography, nature and animals, science and technology and famous people. There is also a choice of difficulty levels.

This game works with individuals or teams, and includes three different handicapping schemes to keep the Smart Alecs from ruining everybody else's evening.

Representative mid-level questions include: "Who finally won India's freedom from Britain? Who was the first President to send military advisors to Vietnam? What type of aircraft was first to complete a round-trip transatlantic crossing?"

The game is easy to play, provided you have a "Master of the Group," an

individual selected by the players to operate the computer. Your Master will type in everyone's names, set handicapping levels, and tell the computer if the question was answered properly.

If you can tolerate the sound and graphics shortcomings, you'll find a very decent trivia game. In fact, you'll find two games—Trivia Fever can be played without the software. The game comes with a book of questions and answers, a pad of score sheets, and a Category Selector spinner.

## CASSETTE ADVENTURES

Level 9 Computing  
229 Hughenden Road  
High Wycombe  
Bucks HP13 5PG  
England

*Reviewed by Charles Cherry*

There are many drawbacks to a cassette-based system, but chief among them is that you can't run real text adventures. Let's face it, a computer without a cavern is merely useful. However, help is here at last from a most interesting place.

While traveling in England I ran across Level 9 Computing. It seems these people are the leading adventure game company in the U.K. They market a series of top notch games for home computers. But there are relatively few British Ataris with disk drives, so the games are released on cassette.

Sophisticated compacting has squeezed everything into 32K. After the cassette loads (over 10 minutes!), you enter a large world. You'll find over 200 rooms with detailed descriptions, a good parser with a large vocabulary, lots of creatures and a little humor. All in RAM. And since it does not have to spin a disk, responses are very fast.

There are presently 6 games available. The first one, **Colossal Adventure**, is a faithful recreation of the original "Colossal Cave" mainframe adventure game. But once you finish, the story expands with 70 more rooms that tie into J.R.R. Tolkien's *Lord of the Rings* trilogy.

The next two games, **Adventure Quest** and **Dungeon Adventure**, continue this "Middle Earth Trilogy" although each can be played as a stand-alone game. If you get claustrophobic in caves and dungeons, please note that Adventure Quest takes place outside.

Science fiction fans can explore **Snowball** and **Return to Eden**, two-thirds of the "Silicon Dream Trilogy." Snowball takes place on a giant spaceship taking 2 million cryogenically frozen colonists to a distant solar system. However, something has gone wrong and you are awakened to deal with it. This game has over 7,000 rooms and is already a classic in England.

Return to Eden is the story of the planet when Snowball arrives. I have not spent any time with it yet, but I understand it's a jungle planet and there's a character named Pepsy Koala. **The Worm in Paradise** will be out soon to complete the series.

The final game, **Lords of Time**, sends you into nine different epochs. You travel from the Ice Age to the Dark Ages to the Future. The worlds in each era are necessarily small, but this makes it an excellent beginning adventure.

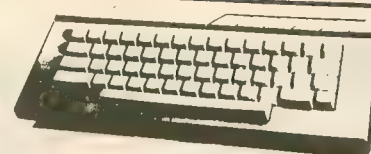
Getting your hands on these games is an adventure in itself. You'll need to visit your local international bank and get a check drawn in pounds sterling. Each program costs 9.90 Pounds. At today's exchange rate that is about \$12. This price includes air-mail postage from England. You can get an entire trilogy for the price of one U.S. disk adventure.







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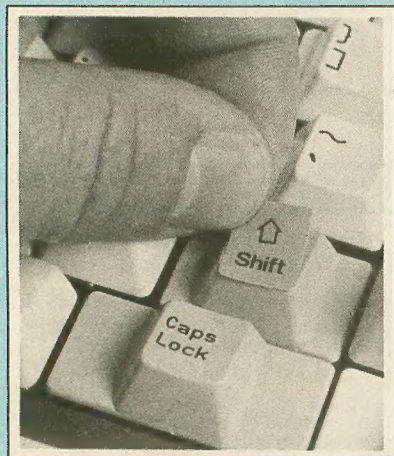
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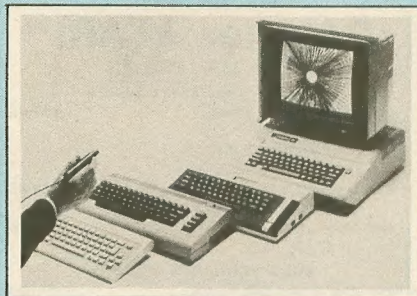
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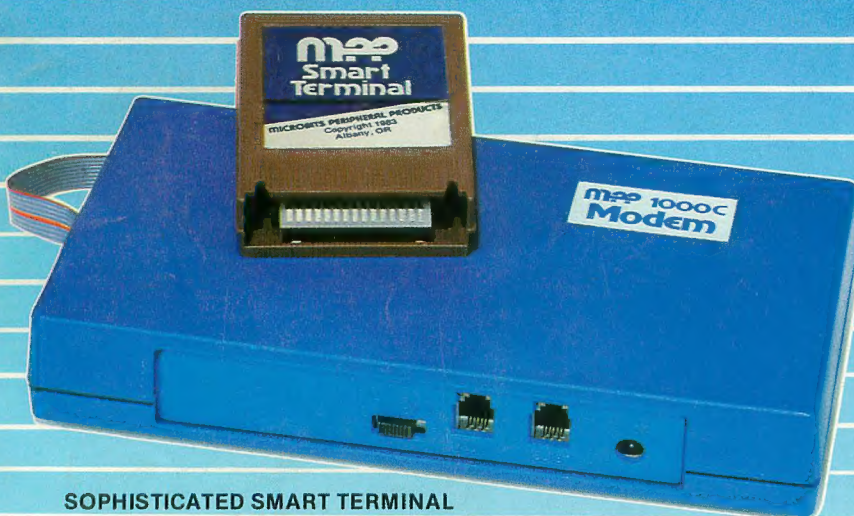




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